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The Influences of consumer attitudes and perceptions about pesticides and produce quality on technology transfer

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THE INFLUENCE OF CONSUMER ATTITUDES AND PERCEPTIONS ABOUT PESTICIDES AND PRODUCE QUALITY ON TECHNOLOGY TRANSFER

by
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Abstract

Consumers have expressed concern about the human health and environmental consequences resulting from the use of agrichemicals by growers to produce food. This paper reports the results of a 1995 survey of consumer attitudes and perceptions about pesticides and fresh fruit and vegetable quality. While there is widespread concern about the human health hazards presented by pesticide residues in food at the time of consumption, this survey population reports greater consumer concern about environmental contamination from agrichemical use. Once familiar with the process of Integrated Pest Management (IPM), the respondents of this survey indicate they would prefer to purchase fruits and vegetables grown with IPM practices, would accept blemished fruits and vegetables in exchange for reduced chemical applications and would pay more for fruits and vegetables grown with fewer chemical applications.

Additionally, the results of a partnership between local growers, a food retailer and a land-grant university with the goal of encouraging local growers to adopt IPM practices in fresh market production are presented. Results of an informal survey conducted in 1995 at a local grocery store document strong support for IPM once consumers understand the attributes of IPM. Recommendations for an IPM education program for employees and consumers are given.

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Introduction

The adoption of modern agricultural production practices in the United States has allowed American agricultural producers to feed the world. Production agriculture makes up about two percent of the total population of the United States, and Americans spend approximately 11% of their disposable income on food. This is considerably lower than other places in the world where it is not uncommon for consumers to spend as much as 35% of their disposable income for food. Many factors have contributed to the production yields achieved by American agricultural producers with the mechanization of farm tasks being one of the most notable. The United States has weather and soil conditions that favor high agricultural production, and has had an abundant water supply. Another factor responsible for high production yields has been the development of agrichemical inputs that enhance plant growth, add necessary nutrients to the soil, and control pests that cause both economic and aesthetic damage to crops.

While there are many who say that the use of fertilizers, fungicides, and insecticides have played a major role in high production yields and low food prices at the consumer level, others believe our agricultural producers are too dependent on chemical inputs to achieve high agricultural production yields. Further, it is often put forth that continued use of heavy amounts of agrichemicals, particularly on soil depleted of natural nutrients, causes large scale soil erosion, and that there is a danger of having the top layer of soil washed away.

This thesis looks at alternative production methods available to agricultural producers, specifically those methods with the potential to reduce the amount of chemicals used in agricultural production and consumer acceptance of fruits and vegetables grown with those practices. In a project underway at Wegmans Food Markets, Inc. (Wegmans), local fresh market sweet corn growers are being encouraged to adopt Integrated Pest Management (IPM) practices. These practices are a way of growing agricultural crops that minimize chemical applications and produce high quality foods, while taking human health and environmental concerns into consideration.

Background

In 1964, Rachel Carson in Silent Spring, issued an early warning about environmental and health impacts posed by continued use of agrichemicals. This was the first modern health scare associated with agrichemicals, and served as a model for future activist efforts aimed at the American public. In 1989, the American public was the target of a food safety scare conducted by the Natural Resources Defense Council (NRDC), an environmental lobby group based in New York City. The NRDC used the print and electronic media to advance their claim that a chemical used to enhance ripening of apples was responsible for thousands of additional childhood cancer cases every year. Representatives from the NRDC were on every major network morning talk show and the story made the front page of newspapers across the country, as well as nationally circulated magazines including Newsweek and Consumer Reports. People panicked and dumped apple juice down drains and school boards in New York City, Chicago, and Los Angeles took apples out of the school lunch program. The manufacturer of the chemical, called Daminozide (Alar), removed the product from the

market and apple growers experienced heavy financial damage from lost sales and reduced consumer confidence in the safety of their product. Wegmans received over 1,000 telephone calls from concerned shoppers between the first CBS "60 Minutes" episode on Alar and the second show a month later. Many toxicologists believe the NRDC used a flawed cancer projection study from the Environmental Protection Agency (EPA) and assumed that chemical applications were made at the maximum allowable rate and application frequency to estimate the increased number of childhood cancers. When the University of California-Davis did the same study, using actual application rates and frequencies, the results showed much more conservative estimates of additional cancer cases in children. Additional studies on the toxicity of Alar suggest that it is not a human health concern, as claimed by the NRDC.

The United Farm Workers (UFW) conducted a boycott of California table grapes for many years based on two themes. One of these was that chemicals used to grow table grapes represented a health risk to consumers who ate California table grapes. Since then, numerous food scares have been associated with agrichemicals. Contrary to this is the data collected by many different agencies on chemical residues found in the food supply. This scientific data indicates that the levels of chemical residues found in food are extremely low and do not represent a health threat to consumers, regardless of age.

Chemical residue levels are routinely reported in PPB (parts per billion), and technology exists to measure residue levels in PPT (parts per trillion) and lower. To put that into perspective, a PPB is the equivalent of approximately one second every 31 years. There are many recognized health authorities who believe that we should increase our consumption of fresh fruits and vegetables to at least five servings a day, and that the health risks of not

increasing fresh fruit and vegetable consumption far outweigh any possible risk from chemical residues.

University of California biologist Bruce Ames has said that the use of agrichemicals has actually improved the health of American consumers by making fruits and vegetables readily available to many people at affordable prices. This only points out that there are at least two sides to every story and that the discussion about the human health impacts of agrichemical inputs can be very lengthy.

What is less open to discussion are the environmental impacts of continued use of large quantities of agrichemicals, particularly in areas where the soil is of poor quality and already depleted of natural nutrients. There are instances in the Midwest of agrichemical residues being found in groundwater and surface water. Intensive agricultural production practices can create soil erosion problems and there is a movement among agricultural producers and environmentalists to make agricultural production practices more sustainable. This means less reliance on agrichemical inputs and more natural ways to grow and produce food and other agricultural commodities.

In response to consumer interest in products that are simpler and less processed, Wegmans has made a conscious effort to remove additives, preservatives, artificial colors and artificial flavors from products under the "Food You Feel Good About" banner. Wegmans carries naturally raised beef, "Beef You Feel Good About", grown without any antibiotics or growth hormones and grazed on range grass. This product is environmentally conscious and represents another choice for customers who are concerned about how their beef is grown. The Wegmans project with fresh market sweet corn is a partnership between Wegmans,

Cornell University, and local growers to bring alternative agricultural production practices to a segment of the fresh market vegetable industry.

Problem Statement

American consumers express concern about the agrichemical inputs used by agricultural producers based on perceptions of human health and environmental issues associated with the use of pesticides. The thesis will examine consumer concerns about pesticides, health risks, and the environmental impacts of pesticides used in food production. Consumer willingness to purchase and accept blemishes on fruits and vegetables grown with fewer chemical applications will be measured. Consumer acceptance of fruits and vegetables grown with new technology, and consumer willingness to modify cosmetic expectations for reduced chemical applications, influence grower adoption of production practices that can minimize chemical applications. Growers depend on a market for their crops to stay in business and need assurance that consumers will purchase crops grown with new technology before they will change production practices that have been used successfully in the past.

Purpose

The purpose of this study is to analyze consumer attitudes about pesticides and produce quality, how those attitudes influence grower adoption of IPM practices, and if a food retailer can facilitate adoption of new technology among agricultural producers. The intent of this study is, first to understand and second, to develop strategies that facilitate technology adoption at the fresh market producer level and how to apply that knowledge to other fresh market crops.

Significance

Wegmans believes that environmental concerns will become an increasingly important factor used by consumers when making buying decisions about products and where purchases are made. Wegmans also believes that supporting or advocating environmentally responsible or conscious products or production practices can become a means of differentiating one retailer from another. This thesis will further the understanding of consumer attitudes about pesticides and produce quality and how those attitudes influence grower adoption of environmentally responsible production practices. Also, the thesis will provide a model that can be used to expand IPM practices to additional fresh market crops.

Methodology

This study will examine the influence of consumer attitudes about pesticides and produce quality on technology transfer in fresh market sweet corn production from the current perspective. Correlational research is used to analyze consumer responses to a series of questions on attitudes and perceptions about agrichemicals and expectations of product quality, and how consumer attitudes and perceptions affect adoption of IPM practices by fresh market sweet corn growers and the ability of a food retailer to facilitate technology transfer.

Hypothesis

This research will show that consumer perceptions about agrichemicals, product quality and aesthetics influence technology transfer at the grower level and retailer ability to facilitate technology transfer.

Definition of Terms

Agrichemical - Synthetic chemicals used for pest control and growth regulation in the production of agricultural products.

Application frequency - How often applications of the same agrichemical input are repeated.

Diffusion theory - The process by which new technology is adopted, beginning with a small number of adopters and increasing gradually until the rate of adoption begins to decline.

Fresh market - Agricultural products, usually fruits and vegetables, that are sold fresh.

Groundwater - Water beneath the earth's surface between saturated soil and rock that supplies wells and springs.

Inputs - Items purchased to carry out a farms operation to include fertilizers, pesticides, seed, fuel, animal feeds, and drugs.

Integrated Pest Management (IPM) - A systems approach to pest control that prevents pest outbreaks and maintains production yields with a minimum of chemical applications.

Parts per billion (PPB) - A unit of measure used to report the amount of chemical in a sample, approximately the equivalent of one second every 31 years.

Parts per million (PPM) - A unit of measure used to report the amount of chemical in a sample, approximately the equivalent of one second every 11 days.

Parts per trillion (PPT) - A unit of measure used to report the amount of chemical in a sample, approximately the equivalent of one second every 30,000 years.

Processed market - Agricultural products, usually fruits and vegetables, that are processed into canned or frozen product.

Selective adoption - The process by which adopters of new technology adopt the parts of the technology best suited to their operations.

Surface water - Water found on the earth's surface in streams, rivers, lakes, and oceans.

Sustainable agriculture - The end result of a variety of alternative production methods that are environmentally friendly and promote healthy soil.

Threshold - A scientifically pre-determined level of insect activity that will cause critical economic damage to the crop unless treated.

Ideological Assumptions

Since 1988, much of the researcher's work has centered on food safety and consumer concerns for a wide variety of products, including fresh fruits and vegetables. One noteworthy consumer concern has centered on agrichemicals used in production practices. Pesticide residue monitoring reports from the US Food and Drug Administration (FDA), California and New York Departments of Agriculture and Wegmans internal testing program have been reviewed. Additionally, there have been conversations with experts in the field of pesticides and toxicology and printed information from recognized health authorities such as the National Institute of Health and former Surgeon General C. Everett Koop have been read. Based on experience and study, it is felt that agrichemical inputs used to enhance growth and control pests are not a health risk to consumers. Assumptions are also made about what the general public knows of modern agricultural production methods and that the knowledge level of the public leads to confusion and misunderstanding among consumers. With less than two percent of the public involved in production agriculture, it follows that many people are unfamiliar with the practices used to grow and produce food. Much of the

public concern about pesticides and other chemicals is linked to a lack of knowledge about the process.

Procedural Assumptions

Several assumptions are being made prior to undertaking the research, again based on work-related experiences. The first is that agricultural producers already view themselves as good stewards of the land and very concerned about improper or unnecessary applications of agrichemicals for environmental reasons. It is assumed that producers are interested in reducing their operating expenses by applying agrichemical inputs only when necessary to prevent serious damage to their crop. Further, assumptions are made concerning consumer perceptions about chemicals used in agricultural production. While consumers say they want fewer chemicals applied to foods, the majority of consumers buy with their eyes and are not willing to accept anything less than perfect fruits and vegetables. To guard against the bias in my assumptions, survey questions must be phrased so as to not lead respondents in any direction. The expertise in Wegmans internal Marketing Research Department and the NYS Integrated Pest Management Program will be used to assist in developing a survey instrument that is unbiased and provides the data required to do this study. Those same groups, in addition to experts at the Rochester Institute of Technology (RIT) will assist in analysis of the survey data to avoid injection of personal bias in the outcome of the case study. Statistical analysis of data will be done using the SPSS for Windows statistical analysis program. Data will be analyzed in terms of consumer buying practices compared to stated consumer interest in purchasing fruits and vegetables produced with a minimum amount of

chemicals applied, as well as the impact of fresh market grower perceptions of consumer expectations on grower willingness to adopt technology that is environmentally friendly.

Scope and Limitations

This thesis will focus on consumers in the Rochester, NY market area and their attitudes and perceptions about agrichemical use and environmental implications, as well as quality and aesthetic expectations of fruits and vegetables grown with minimized chemical applications. Growers are those supplying fresh market sweet corn to Wegmans in the Rochester, NY market area and participating in the Wegmans IPM fresh market sweet corn project.

The survey instrument provides information from the consumer perspective and the thesis will be limited to establishing the impact of consumer perceptions and expectations on growers, and how the food retailer facilitates technology transfer (IPM practices to fresh market growers).

Procedures

In February 1995, local growers supplying Wegmans were invited to participate in a series of workshops teaching IPM practices for fresh market sweet corn. An initial survey was completed to establish a baseline of existing IPM knowledge or adoption on their farm. These same growers will be questioned to determine their intent to implement IPM practices, or supplement existing IPM practices in the 1996 growing season. As previously stated, discussions with growers and others involved in production agriculture indicate that growers consider themselves as stewards of the land and concerned about the environmental issues

associated with chemical use. A survey will be sent to randomly selected shoppers who purchased fresh fruits and vegetables at the Wegmans store carrying IPM grown fresh market sweet corn.

Personal conversations with growers will determine if local growers intend to adopt or implement additional IPM practices in their operations. Survey results will be analyzed to determine if consumers will purchase fruits and vegetables grown with IPM practices and conclusions and recommendations will be offered as to how a retailer can facilitate grower adoption of IPM and consumer acceptance of crops grown with IPM practices.

Long-Range Consequences

The hypothesis of this research is that consumer perceptions about agrichemicals, product quality, and aesthetics greatly influence technology transfer at the grower level, as well as the ability of the retailer to facilitate technology transfer. Should that hypothesis be verified, it would provide compelling evidence that consumers appreciate environmentally friendly growing practices and will support adaptation of IPM practices by purchasing IPM grown products.

A null hypothesis, or equivocal results, will make it difficult for the retailer to use environmentally friendly production practices as a means of differentiation to gain a competitive advantage, as brief as that may be in the food retailing arena.

Chapter II

The Review of Literature

Agriculture and Environmental Concerns

Modern agricultural production practices have brought great efficiency to the American farm. Approximately two percent of the total population of the United States is involved with production agriculture, and produces enough food to provide for the United States and other parts of the world. Americans spend about 11% of their disposable income for food; substantially lower than in other countries where food costs can be as high as 35% of disposable income. Many factors have contributed to high production yields, including mechanization of farm tasks, soil conditions, weather, and an abundant water supply. Chemical inputs that enhance plant growth, add nutrients to soil, and help control pests have also been a major contributor to the success of American farming.

Trautmann, Porter, and Wagenet (1985) indicate that the abundance of American farms is not without a downside when considering the potential negative impacts on the environment resulting from increased applications of synthetic fertilizers and pesticides. The introduction of the steel plow destroyed much of the range grasses that hold soil in place and droughts in the 1930s brought crop failures that resulted in millions of tons of topsoil being lost to wind erosion. Soil erosion affects agricultural production by depleting surface soil and organic material, nutrients, and soil particles that retain water and plant nutrients near the root system. Growers compensate for erosion with increased irrigation and fertilizer applications, and there is growing concern that fertilizers and pesticides are finding their way into the water supply. Ten percent of wells tested on Long Island have been found to exceed

the drinking water standard for nitrogen and 22 pesticides have been found in groundwater in 23 states (Figures 1 and 2). Eighty additional pesticides are believed capable of moving to groundwater under favorable conditions (Trautmann, Porter, and Wagenet, 1985). As a response to growing consumer concerns about the environmental impacts from intensive agricultural production, Wegmans has encouraged growers to adopt IPM practices in their operations. IPM is a crop production method that minimizes chemical applications by using economic thresholds to determine when chemical applications are necessary to prevent crop damage from insects and other pests. Long-term studies at Cornell University show a reduction in chemical applications of up to 50% in some crops when IPM practices are used (C. Petzoldt, personal communication, April 3, 1996).

An article from a California farmer (Buxman, 1994) presents IPM from the farmer's perspective. Maintaining balance between pest and predator is important, and modern pest control practices that depend on chemicals may encourage the development of pest problems, due to disruption of natural predators and ecology. Over time, a generation has grown up thinking that all farmers do is spray, disk, and irrigate, and now a generation of farmers are concerned about eliminating any of the practices that have become familiar. Healthy soils and earthworms used to do naturally what is done today with a variety of chemical inputs, such as neutralizing acidity, aeration, improving water filtration, making nutrients more available, and composting plant residues (Building Your Soil, 1994).

Production agriculture is in a period of transition from farming methods that rely heavily on chemical inputs and degrade cropland to low-input, regenerative practices using organic fertilizers and IPM (Corson, 1994). Wegmans believes that IPM is an important part

of ongoing efforts to improve soil and water quality, as well as reduce agriculture's reliance on chemical inputs.

Consumer Food Safety Concerns

Besides the environmental benefits suggested by IPM, there is another important reason to encourage growers to implement IPM practices wherever possible. IPM gives the agricultural community a means of addressing consumer concerns about chemicals in the food supply. Alar, a chemical applied to apple trees that causes apples to stay on the tree longer and hold up better in storage, is a good example of consumer reaction to chemicals in food. In 1989, the NRDC launched a campaign to remove Alar from the market with the release of a report titled *Intolerable Risk*. The NRDC argued that pesticide levels found in fruits and vegetables present an unacceptable risk to children of increased cases of cancer. *Intolerable Risk* was not peer reviewed and was later found to be based on incorrect assumptions of levels of pesticide residue in foods at the time of consumption. Toxicologist Chris Wilkinson has stated that the NRDC overestimated childhood exposure to pesticides by almost 400 times (Bidinotto, 1990).

A keystone of the NRDC campaign to get Alar removed from the marketplace was an effective communications effort developed by a New York City public relations company (Fenton, 1989). An internal memo documents the strategy the NRDC used to spread their message about Alar and the health risks they claimed children were exposed to from apples. The Fenton Communications' plan to have the Alar story gain a life of its own was very successful. The story was covered by every network morning news program, Newsweek, Consumer Reports, major daily newspapers throughout the United States, and women's

magazines with combined circulation of 17 million readers. Events were timed and sequenced to maintain interest in the Alar story, and the resulting lack of public confidence in the safety of apples was devastating to the apple industry. Parents no longer allowed children to drink apple juice, day care centers poured apple juice down the drain and some schools removed apples from the school lunch program. The Consumer Affairs Department at Wegmans received approximately 1,000 telephone calls from concerned consumers between the first and second CBS "60 Minutes" stories on Alar. This is a tremendous consumer response and shows how effective the NRDC media campaign was. Wegmans learned of the NRDC report and the CBS "60 Minutes" show several weeks before the air date and had its Wegmans brand apple juice, applesauce and apple juice blends tested by a private laboratory for the presence of Alar and unsymmetrical dimethylhydrazine (UDMH), the breakdown component claimed to be carcinogenic by the NRDC. The results of laboratory analysis and information about Alar was at all Wegmans store locations the morning after the first CBS "60 Minutes" show and helped diffuse consumer concerns about Wegmans' brand products. Establishing a dialogue with consumers, and pro-active discussion of consumer concerns are basic tenets of Wegmans and deemed necessary for companies that succeed in today's marketplace (Rosen, 1991).

A counterpoint to consumer concern about the health risks posed by eating apples is that by not using Alar, apples are exposed to higher levels of naturally occurring fungus and the known carcinogenic compounds produced by fungus. The level of Alar in apples rarely exceeded two parts per million (PPM); however, a fungus produced carcinogen called patulin is found in apple juice at up to 45 PPM and is not regulated. Leading scientists continue to express concern about the presence of naturally occurring pesticides in fruits and vegetables

and document tumors in mice fed a diet of commercially raised mushrooms. The scientific evidence against mushrooms as a carcinogen is just as strong as that presented against Alar. A crucial difference, however, is the suspected carcinogen in mushrooms is not concentrated, while the similar compound in Alar was over 2,000 times that normally found in apples (Simmonds and Brosten, 1989).

In addition to Alar in 1989, there have been numerous other food safety scares involving agricultural chemicals and practices. The yearly consumer survey, Trends in the United States: Consumer Attitudes and the Supermarket (Food Marketing Institute, 1995) documents the increase in food safety concerns among consumers as a result of the Alar and Chilean grape situations in 1989, and compares levels of consumer concern on a variety of issues from year to year. The 1995 survey shows 77% of those polled are mostly or completely confident about the safety of the food supply (Figure 3); however, when asking consumers about their level of concern for selected food attributes, 74% indicated residues such as pesticides and herbicides were a serious health hazard (Figure 4). When asking consumers an open-ended question about what they feel are the greatest threats to food safety, pesticides and herbicides were mentioned by 15% of the survey (Figure 5).

A January 1989 survey conducted for a produce marketing organization reported that 78% of those polled were either very or somewhat concerned about pesticide residues on fresh fruits and vegetables. The survey documented that many of those very concerned about pesticides and food safety also had serious concerns about the environment (Center for Produce Quality, 1992).

About two-thirds of the consumers responding to a survey conducted by a produce weekly newspaper indicated they were very concerned about pesticides and chemicals used to

grow fruits and vegetables, with more indicating residues were a serious hazard in 1994 than in 1993. Children under 18 years of age in the home caused concern to increase, with 73% of consumers with children under 18 years of age concerned about chemicals compared to 62% without children (Fresh Trends, 1995).

Residue Testing Results

While there are numerous surveys indicating that consumers are concerned about chemicals used in the production of food, there is also literature reporting the results of pesticide residue monitoring programs conducted by government and private industry. The FDA has distributed results of its pesticide monitoring program since 1987 and those reports document that pesticide residues detected in domestic and imported foods are actually very low, if present at all (Pesticide Program Residue Monitoring, 1989-1994) (Figures 6, 7, and 8). An internal pesticide residue monitoring program conducted by Wegmans confirms the low levels of pesticide residues found in domestic and imported fresh fruits and vegetables by the FDA and others with considerably larger sampling programs (Wegmans Pesticide Residue Testing, 1994).

Studies of Consumer Attitudes About Pesticides

Despite scientific verification of low levels of pesticide residues, consumers continue to express concern about chemicals in the foods they serve their families. Differences in perception of risk from pesticides and actual risk as expressed by college students, women voters, and business people is shown in a chart reprinted by the National Pest Control Association (Figure 9). Consumer perceptions and attitudes about pesticides, food safety,

produce quality, and the environment have been the subject of numerous surveys and studies. Pennsylvania households were surveyed in 1965 to determine their degree of concern about pesticides used in food production. The survey was repeated in 1984 to determine any changes in consumer attitudes about pesticides (Sachs, Blair, and Richter, 1987). The 1984 survey indicated that public exposure to pesticide use and issues surrounding pesticides and food has increased, due in part to media attention. The 1984 survey indicates a material increase in consumer concern about pesticides and wildlife, farmer and farm worker safety, and personal health hazards from eating fruits and vegetables (Figure 10). There was a substantial decline in those who felt the government was doing an adequate job of regulating pesticides and those who use pesticides in their garden dropped by 50% (Figure 11).

Bunn, Feenstra, Lynch and Sommer (1990) conducted interviews with supermarket shoppers and questioned their buying preferences. After showing a video on IPM, shoppers were shown pictures of perfect fruit, and then pictures of the same fruit with 10% and 20% damage from insects. Consumers showed little interest in buying either of the damaged fruits. After being told that the damaged fruit was produced with a 50% reduction in chemical sprays, consumers were willing to reduce their cosmetic and aesthetic expectations in exchange for lower chemical applications (Figure 12). The produce industry believes that consumers will purchase only perfect fruits and vegetables; however, the researchers indicate that with education and information, consumers will accept fruits and vegetables with some blemishes. Bunn et al. (1990) report that some customers are willing to pay twice as much for organic produce and that others who support regional, locally grown, or seasonal production place greater emphasis on taste and freshness than they do product aesthetics. The study concludes that consumers will accept blemished fruits as a trade-off for reduced

pesticide usage, and that reduced pesticide applications can be used to differentiate one product from another. Wegmans hopes to differentiate home grown fruits and vegetables grown with IPM practices from produce offered by competitors.

A survey of Upstate New York consumers in 1989 reported concerns about pesticides used to produce food, with 96% of those surveyed either very or somewhat concerned (Grant, Tette, Petzoldt and Kovach, 1990). Additionally, this study indicated that consumers would accept blemishes on fruits and vegetables, would pay more for reduced chemical applications, and were more likely to purchase fruits and vegetables grown with IPM practices.

Ott, Huang, and Misra (1991) studied the gap between consumer expressions of concern about pesticide residues and consumer buying patterns. Produce and retailer responses to consumer concerns, like more organic products or products certified to be residue-free, have not met with strong positive consumer response. This may indicate, in spite of their concerns about pesticides, consumers feel produce is safe to eat or that the perceived benefits of increased consumption outweigh the perceived risks from pesticides. After the Alar incident in 1989, there was higher consumer demand for organically grown produce. Wegmans found it difficult to find a consistent supply of organic produce or a wide variety of organic produce available. What could be found did not meet consumers cosmetic expectations, cost more than conventional produce, and was not well received by consumers. The results of Wegmans response to consumer requests for organic produce were as suggested by Ott et al. (1991).

Bruhn, Peterson, Phillips, and Sakovitch (1992) studied consumer attitudes about agricultural production practices and the effect of information on consumer attitudes.

Participants were first asked a series of questions to establish attitudes and concerns about food safety. After watching videos describing IPM, participants were asked the same attitude questions and results showed more positive attitudes about farmers and environmental consciousness, chemicals used in agricultural production, and recognition that farmers used a variety of methods to control pests. Almost 50% of the respondents indicated the videos increased their confidence in food safety. The researchers note the 1990 Opinion Research survey indicating that children in the household increased the degree of food safety concern by both men and women. Also observed was the difference between public perception of pesticide dangers and how scientists rate pesticides as a hazard. Scientists are likely to rate pesticides a much lower hazard than the public and express concern about naturally occurring compounds produced by plants to resist insects and other pests. Respondents mentioned environmental issues, and linked pesticide residues with soil and groundwater contamination.

A 1990 telephone survey conducted in the Pacific Northwest indicated that issues of pesticide residues in foods and associated risks were not well understood by the public (Dunlap and Beus, 1992). The lack of control and unfamiliarity with a risk increases the degree of concern associated with that risk. The study reported moderately high public concern about pesticides in food, with higher concern for the environment and even higher concern for groundwater contamination. A high percentage (79%) of respondents expressed concern about pesticide residues in groundwater. This information supports Wegmans perception that consumers are concerned about the environmental impacts of food production. While concerned about pesticides, 74% of respondents indicated that pesticides were needed to protect food against insect and disease damage, and 55% thought that pesticides were necessary to grow food.

Consumer research conducted in Seattle, Washington and Kobe, Japan examined the relationship between certain household characteristics and consumer attitudes about food safety (Jussaume and Judson, 1992). Consumer concerns about pesticides and food safety evident in the United States were beginning to surface in Japan and a number of household characteristics were shown to exert influence on opinions and concerns about food safety and trust in government, business, and farmers to provide safe foods. Age, education, and income affected peoples reaction to food issues and how they assessed the risks or benefits of agricultural production practices. Children under the age of 18 years in the home increased parental concern about food safety and pesticides, and children also brought home information that influenced parental opinions and actions, like recycling efforts or anti-smoking messages. Employment influences opinions and concern, and full-time homemakers raising children indicated a higher degree of concern about pesticides. Food consumption patterns also influenced opinion and concern, with homes consuming more vegetables having greater concerns about pesticides and food safety, as well as reduced trust in government, business, and farmers to assure food safety.

In an article reviewing surveys done in the United States dealing with consumer perceptions of pesticides used in food production, Dittus and Hillers (1993) specifically looked at how trust affects perceptions of risks and benefits associated with pesticide use. As reported by Sachs et al. (1987), a comparison of 1965 and 1984 surveys of Pennsylvania consumer indicated a substantial decrease in consumers who trusted the government to adequately regulate pesticides. A similar decrease was noted when consumers were asked if food sold in retail food stores was being adequately inspected, and to a lesser but still notable extent in consumer perceptions of farmers using pesticides in a safe manner. There

was a correlation between low trust and higher concern about pesticides, food safety, and the environment. Those with low trust did not perceive pesticide use having as high a benefit as those with higher trust. Confidence in the adequacy of pesticide regulation or degree of concern about pesticides and health varied depending on the level of trust. Because trust has such a strong influence on perception, some discussion about pesticide regulation and the measures taken to protect human health and the environment would be important components of any educational program intended to improve consumer understanding of agriculture and food production.

Telephone interviews with over 1,200 people surveyed perceptions and attitudes people hold toward biotechnology, and how they felt about the role of biotechnology in the food system (Hoban and Kendall, 1993). Biotechnology has already played a role in IPM programs and will play an even larger role in the future. The authors indicate that familiarity with new technology and believing in the benefits make it much easier for people to feel comfortable with the technology and increases the likelihood of acceptance. Most respondents had positive views about the effects of science and technology on their lives; most had very strong feelings about the natural environment and there was concern about environmental pollution and support for environmental protection. Wegmans interest and support for IPM is based on perceptions of consumer interest and concern about the environment.

Underhill and Figueroa (1993) measured consumer preference for fruits and vegetables grown with reduced levels of synthetic pesticides. Labels were created to give consumers information about production practices and the level of pesticide reduction achieved with different production practices. Consumers were asked a series of questions

about pesticides and food safety, pesticides and environmental impact, and consumer willingness to purchase and pay more for produce grown with fewer synthetic pesticides. Over 70% indicated that pesticide residues in food were a serious or moderate health hazard and that pesticides used to produce food were a serious or moderate environmental contaminant. Most respondents were willing to pay up to 10% more for fruits and vegetables grown with IPM practices.

A survey of consumers shopping at farm stands and farm markets in Massachusetts provides additional information on attitudes and perceptions of IPM (Anderson, 1994). Different farm stands and farm markets presented varying levels of information about IPM to consumers for a two week period, ranging from simple posters to stickers on bags and brochures, with clerks thanking the customer for buying IPM produced corn. Despite intense IPM promotion at selected farm stands, only five percent of the consumers purchasing at those locations knew their corn was grown with IPM practices. The consensus was that two weeks was insufficient time for an effective consumer education campaign, and that an entire season would likely be needed to raise consumer awareness. While only 19% had heard of IPM, 85% indicated they would prefer to purchase fresh market sweet corn grown with IPM practices. Over 60% indicated they would seek out farm stands or stores selling IPM grown produce, particularly if those farm stands or stores were easy to get to. Eighty-five percent indicated they would pay up to 10% more for IPM grown produce.

There is a critical gap between public perception of pesticide residues and what has been documented in years of scientific research and laboratory analysis. In reporting the findings of focus groups held in Denver and northeastern Colorado in 1989, Auld, Kendall, and Chipman (1994) suggest that focus groups may be used to increase communication

between the public and those who communicate risk. Issues discussed in those focus groups centered on identifying consumer and producer concerns about agrichemicals used in food production and what information should be made available about agrichemicals used to produce food. Concern for health risks from pesticide residues was moderate, although organic producers and suburban consumers expressed a higher degree of concern than other participants in those focus groups. All participants felt that consumer demand for perfect looking fruits and vegetables was a primary driver for use of pesticides by producers, and that consumers should be willing to lower their expectations in exchange for reduced chemical applications. Both conventional and organic farmers view themselves as stewards of the land, and are interested in protecting consumer and farm worker health and the environment. Some organic producers indicated that food retailers don't provide enough support for organically grown product and are not supportive of local or small farmers. This is not true of Wegmans, where over 400 local growers supply fresh market seasonal fruits and vegetables. Regarding food safety messages, participants indicated that effective messages give both sides of an issue and present information that people can use to make informed decisions and exercise control over their lives. Messages must acknowledge the concerns and biases of the audience, be fair, accurate and put risks into perspective.

There is disparity between perceptions of the US food supply as one of the safest in the world and consumer concerns about microbial contamination and pesticide residues in foods. A University of Kentucky survey (Byzby and Skees, 1994) indicates that consumers are more concerned about fats and cholesterol in foods (33%) and bacterial food poisoning (30%) than pesticide residues (18%). Consumer concerns about microbial contamination are increasing, especially in light of the E. coli 0157:H7 problem at a fast food restaurant on the

West Coast that resulted in the deaths of three children. This is also reported in Trends in the United States: Consumer Attitudes and the Supermarket from the Food Marketing Institute (1995). There are costs and benefits associated with continued use of pesticides just as there are costs and benefits from banning or severely restricting pesticides used to produce food (Figure 13). The environmental costs of continued heavy reliance by agricultural producers on pesticides include soil erosion and runoff, ground and surface water contamination, and the impact on wildlife. The costs of restricting or banning pesticides could include greater pest damage, reduced production yields, and higher food prices. Wegmans believes that the environmental costs associated with heavy use of pesticides by growers will become more important to consumers and are a primary reason for encouraging growers who supply Wegmans to implement IPM practices.

There was a correlation between produce consumption patterns and the presence of children in the household with an increased perception of risk from pesticide residues in fresh produce (van Ravenswaay, 1995). The researcher also indicates household income and level of education affect perception of risk. Public perception of risk from pesticides has increased since 1960 and consumers believe the amounts of pesticide residues in food have increased. van Ravenswaay also documents the gap existing between the public and the scientific community on the amounts of pesticide residue in the food system and presents data that supports public concern about pesticides and environmental impact. The author suggests that public perceptions of the environmental impacts of agrichemicals may be just as great as any food safety concerns. This is the approach that Wegmans has taken with the fresh market sweet corn project. Wegmans interest in IPM and having growers adopt IPM practices is based on the environmental benefits that IPM offers.

A study of American consumers (Cambridge Reports, 1988) indicated that almost one-third did not purchase certain kinds of food because of chemicals used in production and 45% indicated they would accept slight blemishes if no pesticides were used. Many of those polled changed their day-to-day behavior because of concern about the environment (48%) and 50% indicated that groundwater was contaminated to some extent.

The unpublished results of an in-store consumer survey at Wegmans (Clark, 1995) indicates that when consumers better understand IPM and the possible benefits of IPM production practices, there is a high level of consumer support for IPM grown fruits and vegetables.

Integrated Pest Management

IPM is an evolutionary concept of pest control that was first presented during the 1950s. Today, many view IPM as an important part of a long-term goal to develop agricultural production practices that are more sustainable and minimize the use of chemical pesticides. Cate and Hinkle (1994) emphasize the role of ecology and natural control in IPM, and that eradication of pests is not necessary. The objective is to manage and control pests by using IPM techniques to enhance natural control methods like weather, parasites, predators, disease agents, and intolerant or resistant hosts. Pesticides are used only when necessary to prevent unacceptable pest populations, as determined by assessing the potential for damage and ecological, sociological, and economic costs of the control measures. Biotechnology produces plants and animals engineered to resist disease and pests, and chemicals pests use to communicate are now reproduced in a laboratory and used to interfere with pest reproduction or increase attraction to biological control agents. These advances

can be an important supplement and enhance ecological or natural control if the objective of IPM is to successfully manage pest populations.

Adoption of Integrated Pest Management

While Wegmans supports IPM and has actively encouraged growers to implement IPM practices wherever possible, there are many factors that influence a growers decision to implement. Ridgley and Brush (1992) report that even after new technologies have demonstrated positive results, few adopters implement fully. Selective technology adoption gives growers the opportunity to fit technology to their own particular situation, condition, or needs; however, may result in less than the full potential of the technology being realized. With IPM, the emphasis is more conceptual and requires changing or modifying long standing production practices. With an emphasis on non-chemical, natural control methods, IPM requires active participation by the grower, as opposed to more conventional control methods where chemicals are sprayed on a regular basis to prevent pest problems. The researchers studied five factors to see how they influenced adoption of IPM, including education, influence of Cooperative Extension, fresh market strategy, family farm type, and farm diversity. Growers with higher education had higher rates of adoption than growers with lower education. Growers valuing information from Cooperative Extension were more likely to adopt IPM concepts. Fresh market growers, aware of consumers' demands for perfect looking fruit, were very sensitive to any kind of damage to their crop and more likely to incorporate monitoring and beneficial insects to prevent insect infestations and reduce insect damage. IPM adoption was highest on family farms, particularly when there were multiple

generations involved with the farm. Farms devoted to a single crop are more likely to adopt a higher percentage of IPM components.

New ideas, technologies or innovations are introduced and adopted or rejected in a process known as diffusion theory (Lambur, Whalon, and Fear, 1985). Innovations are often re-invented during the adoption and implementation stage, and because IPM consists of a number of related concepts and processes, adoption can take longer to implement and be more difficult than relying on traditional chemical control methods. A means of facilitating IPM implementation among growers is to make the concept less complex to those unfamiliar with it. By breaking IPM down into a number of components and implementing on a gradual scale, the likelihood of implementation increases. Wegmans doesn't expect the growers involved in the fresh market sweet corn IPM project to have a full IPM program implemented in a single growing season; however, growers are expected to increase their level of IPM participation over several years.

Fernandez-Cornejo, Beach, and Huang (1992) surveyed vegetable growers in Texas, Florida and Michigan to determine why some growers are more likely to adopt IPM production practices than others and study the decision process growers use. Fruit and vegetable growers spend substantially more on pesticides than other types of farms in the United States and the potential for IPM to reduce costs associated with chemical inputs is one reason some growers choose to adopt IPM. The process of deciding whether to adopt or not involves first becoming aware of the innovation or new technology, seeking information, forming an opinion, deciding to adopt or not, and implementing if the decision is to adopt. The decision process ends after a trial period with the decision confirmed as correct or reversed. Diffusion theory illustrates the process of technology adoption, where

a few adopt initially with further adoption increasing over time. As those who have adopted the technology reaches and surpasses those who have not, the rate of adoption decreases until there is no further adoption. Rate of adoption is influenced by perception of the innovation as an improvement, compatibility of the innovation with tradition and experience, how complex the innovation is, the feasibility of trying the innovation on a limited basis, and the visibility of results. This is a potential obstacle to IPM implementation, as the economic benefits of IPM can be difficult to quantify and the results of IPM practices hard to measure and observe.

Business Perspective on Environmental Issues

The literature contains numerous references to consumer concerns about pesticides and the environment. The literature also presents environmental issues from a business perspective and how those issues might be used as a means of differentiation. Gatty (1995) reports that the "green" movement has gone from being a hot button to a back-burner issue for manufacturers and retailers as consumer interest seemingly fades. As suggested by Ott et al. (1991) consumer interest in products that are environmentally friendly often does not translate to sales, and some believe that "green" products will receive less shelf space in the future. Pollster Peter D. Hart contends the public is sending the message that protecting the environment is important and warns that companies who ignore consumer concerns about the environment court economic disaster. The course of action that Wegmans has undertaken is contrary to the actions of large, national food retailers like Kroger and at odds with the opinion of the Food Marketing Institute. Wegmans' offering consumers the choice of beef grown without any antibiotics or growth hormones, and grazed on range grass, is a response

to a growing number of consumers who have expressed interest in this product. Sales are increasing, indicating a customer base willing to support their environmental concerns with their dollars. This has implications for the fresh market sweet corn project and may indicate that consumers will support IPM produced vegetables as well. Wegmans believes there is an opportunity to use positive environmental efforts to differentiate itself from competitors.

Luck, history and being first to market can result in a second rate technology being a winner from a marketing perspective (Lohr, 1995). IPM is not second rate technology; however, the potential impact of being first on the market with IPM grown products cannot be overlooked. In 1994, Wegmans set out to bring home grown fresh market sweet corn produced under IPM practices to customers in the 1995 season. Wegmans was the only retailer in New York offering sweet corn grown under those conditions. Wegmans intends to use IPM growing practices to differentiate itself from competitors, but realizes that any marketing advantage is short lived in an industry as competitive as food retailing. Wegmans expects that other food retailers will take the same approach and that Cornell Cooperative Extension will begin to teach other fresh market sweet corn growers the IPM concepts. Ultimately, Wegmans believes other retailers will support IPM practices and encourage their growers to adopt IPM in their operations. The benefits of wide-spread adoption of IPM practices in agricultural production are considerable, and Wegmans will be associated with helping the change take place.

In American Printer, Ferris (1995) reports a new focus on marketing with an environmental twist is being used to differentiate some progressive printing firms from their competition. The company that successfully markets their environmental conscience can develop a tangible competitive advantage, and become the service provider of choice.

Establishing a dialogue with customers, potential customers and the community to review positive environmental actions helps position your company as a responsible and valuable member of the community.

Zandl and Leonard (1992) indicate there is a fundamental connection between individuals, society and the environment which directly contrasts the lack of connection to agriculture by an overwhelming number of American consumers. Environmentalism is a perceived product benefit requiring a long-term perspective. "Green" marketing often does not generate an immediate increase in sales; rather, companies committed to "green" marketing are positioning themselves for future growth.

While adapting IPM programs initially helped growers reduce operating costs by reducing chemical and labor costs, growers now are looking for ways to use IPM as a marketing tool to help them gain market share (Morin, 1995). Like Wegmans, growers question if consumers will support IPM practices by purchasing products grown under IPM and if consumers are willing to pay more for products that are grown under environmentally responsible methods. The benefits of IPM are clear, as are several barriers like grower uncertainty about any discussion of production practices and calling attention to pesticides. Another barrier is retailer reluctance to carry yet another product line in addition to conventional and organic. Consumer unfamiliarity with IPM may be the greatest barrier IPM faces, making consumer education a key component of any successful marketing program. IPM will play a major role in agricultural production in the future, and government goals for IPM adoption should generate public awareness, exposure, and education. Improved consumer knowledge and acceptance of IPM has the potential to be financially rewarding for farmers that adopt IPM practices and present a positive message to the public.

Successful companies change what customers value, how that value is delivered and then, increase the level of value customers expect. Treacy and Wiersma (1993) indicate that a key to success, and staying ahead of competition, is to pick one value discipline to excel in, and at least match industry standards in the other two. While mastering one value discipline is necessary today, it is likely in the future that successful operations will need to master two. That seems fitting, as one of the components of success is continually raising the standard beyond the level achievable by competition. Wegmans excels in customer intimacy and product leadership. The Wegmans project with IPM grown sweet corn will bring consumers a product that is very different from that available at competing food retailers. Conversations with the IPM group at Cornell University confirm that other retailers have not moved in this direction.

Chapter III

Data Collection and Analysis

Survey Instrument

The survey instrument combined questions from two previous consumer surveys. The first was a telephone survey of 540 homes in August and September 1989 to track consumer attitudes and perceptions about pesticides (Grant, Tette, Petzoldt, and Kovach, 1990). The second measured consumer preferences for non-conventionally grown produce (Underhill and Figueroa, 1993).

History and Response

The survey was mailed to 600 consumers in the Rochester, New York market area in October 1995. Consumers who had purchased fresh produce at the Wegmans' Hylan Drive store during the Summer of 1995 were selected randomly from the Wegmans Shoppers Club database. The list was stratified into equal numbers of heavy, medium, and light produce purchasers. The purchaser groups were not defined by a set dollar range; rather, a larger list of potential survey recipients was ranked by total dollars spent for fresh produce over a period of time. Heavy produce purchasers spent the most, light produce purchasers spent the least and medium produce purchasers were in the middle. Wegmans Market Research Department defined the produce purchase classification and provided the names of 200 consumers in each produce purchase group.

A cover letter on letterhead from the Rochester Institute of Technology, School of Food, Hotel and Travel Management, Department of Graduate Studies, signed by the Chair

of the Department and the author was included along with a new one dollar bill as an inducement to respond. There was an even distribution of responses from the different produce purchase groups (106 heavy, 100 medium, 96 light). Of 600 surveys initially mailed, 548 were delivered, and 302 responses were received (55%). This response rate was achieved with the initial mailing; there were no follow-up phone calls or other reminders. Approximately 10% of the respondents returned the dollar bill and indicated they did not need a monetary incentive to answer the questions. Thirty respondents asked for a summary of the survey results. The requests for a summary, combined with a 55% response rate, indicates a very high level of interest in the research topic. A copy of the survey instrument and cover letter are provided in Appendix A.

Demographics

Demographic information shows the survey population to be predominately White (87%) and female (75%). Over 40% of the respondents indicate they live in households with children from infants to 12 years of age. Most respondents live in suburban areas (63%) with much of the suburban population increase coming from those who grew up in city and rural areas. Sixty percent report household income greater than $40,000 before taxes in 1994; of those, 50% report household income greater than $60,000. The survey population is well educated with 42% completing college and 21% doing some post-graduate work. Almost 60% of the survey population is between the age of 20 and 49 years of age.

SPSS for Windows was used to tally and categorize responses to questions asked of the survey population. The results of that analysis are provided in five Tables giving the percentage of positive responses received from the produce purchaser groups.

Purchasing Habits and Decisions

Table 1 reports responses to questions about purchasing habits and decisions regarding fresh fruits and vegetables. The percentage of respondents thinking about how or where their food is produced before reaching the grocery store is positive across all produce purchase categories (70%). Heavy produce purchasers indicate a higher than average positive response; responses from medium and light purchasers are fairly equal and lower than the average of the survey population. Respondents across the survey population indicate a strong positive response when asked if they thought about how or where their food is produced before it reaches the store, but they did not carry that response over to their purchase of fruits and vegetables grown in certain countries. Just over 76% of heavy produce purchasers thought about how or where their food was produced; however, only 53% did not purchase fruits and vegetables grown outside the United States. The percentage of heavy purchasers not buying imported fruits and vegetables is higher than the average of the survey population, but this is observed only in the heavy purchaser group. Just under 40% of the medium purchasers and less than 33% of the light purchasers avoid buying fruits and vegetables grown in certain countries.

There was a strong positive response to buy fruits and vegetables grown in New York, with 70% indicating they are more likely to buy locally grown products. Medium produce purchasers are above, and light purchasers are below the average of the survey population. The strong positive response shows support for locally grown fruits and vegetables and local agricultural producers. Responses indicate that while most respondents do not avoid buying fruits and vegetables imported from some growing areas outside the United States, most would prefer to buy fruits and vegetables grown in New York.

Table 1. **Statements Indicating Purchasing Habits and Decisions Regarding Fresh Fruits and Vegetables**

	Percentage Indicating Yes or Very Likely	Heavy	Medium	Light
1.1	Think about how or where food is produced before it reaches the store	76	67	65
1.2	Avoid buying fruits and vegetables grown in certain countries	53	38	32
1.3	More likely to buy fresh fruits and vegetables grown in New York	70	76	65
1.4	Likely to go to another grocery store for organically grown fruits and vegetables	21	16	14
1.5	Likely to go to another grocery store for IPM grown fruits and vegetables	22	16	17
1.6	Spend $50 or more each week on groceries	60	63	66
1.7	Spend at least 10% of weekly grocery dollars on fresh fruits and vegetables	41	57	53

When asked if they would go to another grocery store for organically grown fruits and vegetables, there was a strong negative response. Only 17% indicated they would be very likely to go to another store with heavy produce purchasers considerably above the average of the survey population. Across different produce purchase categories, 38% indicated they are not likely to go to another store for organic produce, with another 45% somewhat likely to shop another grocery store for organic produce. Location of the other

store may be an important factor in the decision to switch to another grocery store for organically grown produce.

If their current grocery store did not carry fruits and vegetables grown with IPM practices, respondents are not likely to go to another store to buy IPM grown fruits and vegetables. Only 17% indicated they would be very likely to go to another store. Heavy produce purchasers are more likely to go to another store than either medium or light purchasers. Just over 48% of the survey population said they would be somewhat likely to go to another store for IPM grown produce with very little difference between the produce purchase categories. As with those somewhat likely to go to another store for organically grown produce, the location of the other store may influence a more positive or negative response. Just over one-third of the survey population (35%) indicated they are not likely to go to another store for IPM grown fruits and vegetables. This percentage is similar to those indicating they are not likely to go to another store for organically grown produce.

Heavy produce purchasers spend more money weekly on groceries than either medium or light produce purchasers with 98% spending at least $50 per week, compared to 84% of medium purchasers and 75% of light purchasers. The greatest difference in weekly grocery expenditures is noted among respondents who spend more than $100 per week. Over 38% of heavy purchasers spend more than $100 per week, compared to 20% of medium purchasers and only 9% of light purchasers.

Across the survey population, 88% indicate they spend at least 10% of their weekly grocery money for fresh fruits and vegetables. Responses show that 50% spend between 10% and 24%, and 38% spend more than 25% of their weekly grocery dollars on fresh fruits and vegetables. For heavy purchasers, 54% spend 25% or more of their grocery dollars on

fresh fruits and vegetables. This is strikingly higher than either medium or light purchasers (30 and 28%). Over 50% of medium and light produce purchasers spend between 10% and 24% of their grocery dollars for fresh produce. Almost 20% of the light purchasers spend less than 10% a week on fresh fruits and vegetables.

Knowledge or Use of Pesticides

Table 2 presents responses to questions asked about the respondents' knowledge or use of chemical, biological, or natural pesticides and awareness of IPM. Almost two-thirds of the survey population know the names of chemical pesticides, indicating a high level of awareness. This is not surprising, considering the media attention that has been focused on pesticides and food production in the past ten years. Awareness of chemical pesticides for heavy produce purchasers is higher than medium and light purchasers, indicating that heavy purchasers may be more interested in or likely to retain information about pesticides and growing practices presented in a variety of ways. Both medium and light purchasers indicated an awareness level lower than the average of the survey population.

Table 2. **Statements Indicating Knowledge or Use of Pesticides and Pest Control Practices**

	Percentage Indicating Yes	Heavy	Medium	Light
2.1	Know names of chemical pesticides	69	62	61
2.2	Have used chemical pesticides in home, lawn, or garden	62	59	62
2.3	Use biological or natural pesticides in home, lawn, or garden	54	43	33
2.4	Have heard of IPM	23	17	17

Almost 61% of the respondents indicate they have used chemical pesticides in their home, lawn, or garden. Responses from the produce purchase categories are close to the average of the survey population. This indicates that for the survey population, previous experience with pesticides does not have a negative effect on either produce purchases or consumption.

Survey responses indicate that 44% of the respondents use natural or biological pesticides in their home, lawn, or garden. The positive response for heavy purchasers is 10 points higher than the average of the survey population with the positive response for light purchasers 10 points below the average. The 20 point range of positive responses between heavy and light purchasers indicates that heavy purchasers are more likely to be aware of alternative pest control measures, and perhaps more concerned about the effects of chemical pesticides for a variety of reasons. Light purchasers are less likely to use natural or biological control measures, which could indicate reduced awareness of alternative pest control methods and lower levels of concern about chemical pesticides.

Across the survey population, 19% indicated that they had heard of IPM. The positive response from heavy purchasers is above the average of the survey population, while medium and light purchasers are slightly below the average. The low positive response indicates opportunities to improve consumer knowledge are plentiful and should be developed if consumer awareness of IPM is to increase.

Chemical Pesticides, Health Hazards and the Environment

Table 3 reports concerns about chemical pesticides in food, pesticide residues as a health hazard and pesticides as an environmental contaminant. In Table 3, responses

indicating varying degrees of concern have been combined into a single positive response for consistency and convenience. For example, when reporting concern about chemical pesticides in food, responses indicating the respondent was either very or somewhat concerned are combined. Percentages representing the varying degrees of concern making up the combined response are provided at the end of each statement. The percentage of heavy purchasers very concerned about the use of chemical pesticides in food (43%) was much higher than the average of the survey population, just as the same response for light purchasers (29%) is well below the average. The 13 point range between the percentage of heavy and light produce purchasers very concerned about chemical pesticides in food indicates that as purchase and consumption increase, the level of concern increases as well. This may be the result of heavy purchasers being more interested or concerned about agricultural production practices or more likely to have access to, and retain information about pesticides from a variety of sources. Just the opposite is true for those somewhat concerned about chemical pesticides in food with positive responses for light purchasers being decidedly higher than heavy purchasers. Across all produce purchase categories, 95% of respondents indicate they are very or somewhat concerned about the use of chemical pesticides in food.

As with responses indicating concern about chemical pesticides in food, there are differences of opinion about pesticide residues as a health hazard between heavy and light produce purchasers. Heavy produce purchasers are more likely to rate pesticide residues a serious health hazard to consumers. Of respondents rating pesticide residues in food at the time of purchase a serious health hazard to consumers, there is a nine point range between heavy and light produce purchasers (26 vs. 17%) with medium purchasers at the average of

the survey population. Of respondents rating pesticide residues a moderate health hazard to consumers, there is a 14 point range between heavy and light purchasers (32 vs. 46%) with light purchasers more likely to rate pesticide residues a moderate health hazard for consumers. As with other responses, higher levels of concern expressed by heavy purchasers may result from greater interest in food or greater access to information on pesticides and food production from a variety of sources. Across all purchase categories, 60% of respondents felt that pesticide residues in food at the time of purchase presented either a serious or moderate health hazard to consumers. This is a substantially lower positive response than shown with concern about chemical pesticides in food, where 95% indicate they are either very or somewhat concerned. At the same time, 40% of respondents indicate pesticide residues in food at the time of purchase are a less than moderate health hazard.

Table 3. **Statements Indicating Concern About Chemical Pesticides in Food, Health Hazards and Environmental Impacts**

	Percentage Indicating Yes	Heavy	Medium	Light
3.1	Very or somewhat concerned about chemical pesticides in food they eat **(43 and 52%) (36 and 60%) (29 and 64%)**	95	96	93
3.2	Believe pesticide residues in food present a serious or moderate health hazard to consumers **(26 and 32%) (22 and 37%) (17 and 46%)**	59	60	63
3.3	Believe pesticides are a serious or moderate environmental contaminant **(35 and 35%) (29 and 39%) (28 and 37%)**	70	69	65

Those rating pesticides used in food production as an environmental contaminant did not exhibit the wide difference of opinions shown when rating pesticides as a health hazard to consumers. As with other questions, heavy purchasers expressed greater concern about pesticides and environmental contamination. Medium and light purchasers are likely to rate pesticides a moderate environmental contaminant. Across the different produce purchase categories, fewer respondents indicated pesticides used in food production cause a small amount of environmental contamination, were not a problem, or were not likely to cause any environmental contamination. The concern expressed about pesticides as a serious or moderate environmental contaminant is higher than was expressed about pesticides as a serious or moderate health hazard to consumers.

Willingness to Accept Blemishes and Pay More for Reduced Pesticides

Willingness to accept blemishes on fruits and vegetables grown with fewer pesticide applications and pay more is summarized in Table 4. Across all produce purchase categories, 61% of respondents indicated they would accept blemishes for fruits and vegetables certified pesticide-free. This perhaps should have been worded as "pesticide residue-free" to avoid adding to the confusion that some consumers have about organic produce and pesticides with many thinking that organic produce is grown without pesticides. Organic growers do not use synthetic pesticides, but they do use naturally occurring pesticides. Consumers will accept blemishes for what they believe to be pesticide-free produce. Heavy purchasers show a higher than average positive response, while both medium and light purchasers are lower than the average of the survey population. There is a 35 point difference between those heavy purchasers willing to accept blemishes for pesticide-free and those who are not (68 vs. 32%).

Heavy produce purchasers will reduce their expectations for perfect looking fruits and vegetables in exchange for the benefits they perceive pesticide-free produce to offer. The difference between light purchasers willing or unwilling to accept blemishes for pesticide-free is only 11 points, with just over one-half of light purchasers willing to accept blemishes. Light produce purchasers are not as concerned about pesticides, and do not perceive pesticide-free fruits and vegetables to offer the same benefits as heavy purchasers.

Table 4. **Statements Indicating Willingness to Accept Blemishes on Fruits and Vegetables and Pay More for Reduced Chemical Applications**

	Percentage Indicating Yes	Heavy	Medium	Light
4.1	Will accept blemishes for pesticide-free fruits and vegetables	68	59	56
4.2	Will accept blemishes for IPM grown fruits and vegetables	66	59	55
4.3	Will pay more for pesticide-free fruits and vegetables if appearance and quality are the same as standard produce	71	73	71
4.4	Will pay more for IPM grown fruits and vegetables if appearance and quality are the same as standard produce	72	74	70
4.5	Willing to pay up to nine percent more for pesticide-free fruits and vegetables	72	73	76
4.6	Willing to pay up to nine percent more for IPM grown fruits and vegetables	79	69	78
4.7	More likely to purchase IPM grown fruits and vegetables than standard produce if available in grocery store	93	87	86

Across the survey population, 61% indicate they would accept blemishes such as spots on fruits or holes in leafy vegetables for certified IPM grown fruits and vegetables. Heavy purchasers are above the average of the population, and light purchasers are below the average with a 10 point range between heavy and light produce purchasers. Responses are identical to an earlier statement (Table 4, 4.1) indicating that respondents would accept blemishes for pesticide-free fruits and vegetables. This similar response across different produce purchase categories may indicate that once respondents are familiar with IPM, they have as high a degree of confidence in the safety and environmental benefits of IPM grown as they do with produce certified as pesticide-free.

Over 71% of the survey population indicate that if quality and appearance of standard produce and certified pesticide-free produce are the same, they would pay more for pesticide-free fruits and vegetables. There are no meaningful differences in the positive or negative responses across different purchaser categories, a strong correlation of agreement among the survey population.

Over 72% the survey population indicate that if the appearance and quality of IPM grown fruits and vegetables are the same as standard produce, they will pay more for fruits and vegetables grown with IPM practices. Medium purchasers are slightly above the average, heavy purchasers at the average, and light purchasers slightly below the average of the survey population. Overall, responses to this question are almost identical to an earlier statement indicating that respondents would pay more for pesticide-free fruits and vegetables. This may indicate that across the survey population, respondents perceive the benefits of IPM grown fruits and vegetables and pesticide-free fruits and vegetables to be of equal value.

For respondents willing to pay more for pesticide-free produce, 73% would pay up to nine percent more. A much smaller number (23%) will pay between 10 and 24% more and a very small percentage of the survey population will pay 25% or more for pesticide-free fruits and vegetables. Across the different produce purchase categories, responses are close to the average of the survey population. One exception to this was the percentage of those willing to pay 25% or more for pesticide-free fruits and vegetables, where heavy purchasers are almost double the average of the survey population.

As a population, 75% of the respondents will pay up to nine percent more for IPM grown fruits and vegetables. For heavy purchasers, a higher percentage will pay up to nine percent more for IPM grown than will pay the same premium for pesticide-free produce (79 vs. 72%). Twenty-two percent of the survey population will pay between 10 and 24% more for IPM grown fruits and vegetables. The number of medium purchasers willing to pay between 10 and 24% more is higher than either heavy or light purchasers with a difference of nine and 11 points, respectively. The number of light purchasers willing to pay 25% or more for IPM grown fruits and vegetables is higher than the average of the survey population, but overall, not many respondents are willing to pay this much more.

Across all purchase categories, 89% of respondents indicate they are more likely to buy fruits and vegetables certified as IPM grown. This response indicates strong support for IPM practices, and may have been influenced by a description of IPM preceding the question. Responses from this survey population are a strong indication that when people have a better understanding of IPM and its components, they support the concept and will demonstrate support by purchasing fruits and vegetables grown with IPM practices.

Age Distribution

Table 5 provides the age distribution among the survey population. For this population, 81% do not have children under five years of age living in the household. Among heavy produce purchasers, 25% report at least one child under five years of age living in the household. The percentage of heavy purchasers with one child under five years of age (21%) is more than double the medium or light produce purchasers with one child under five years of age. Children consume large quantities of fresh fruits and vegetables, so a high percentage of children under five years of age in heavy purchaser households is not surprising.

Table 5. **Statements Indicating Age Distribution Among Respondents**

	Percentage Indicating Yes	Heavy	Medium	Light
5.1	Households with children under five years of age	25	18	17
5.2	Households with children between five and 12 years of age	29	18	17
5.3	Households with children between 13 and 19 years of age	17	18	12
5.4	Households with people between 20 and 29 years of age	15	25	38
5.5	Households with people between 30 and 39 years of age	43	36	29
5.6	Households with people between 40 and 49 years of age	37	36	21
5.7	Households with people between 50 and 59 years of age	22	16	15
5.8	Households with people over 60 years of age	18	20	19

Just over 21% of all respondents reported children between five and 12 years of age living in the household. The average for heavy purchasers (29%) is above the average with medium and light produce purchasers below the average and close to each other. Combined responses show 41% of the respondents having children ranging from infants to 12 years of age living in the household. Among heavy produce purchasers, 54% of the households have children in those age groups, compared to only 35% of the medium and 34% of the light produce purchaser households. There is a strong correlation between children under 12 years of age living in the household and the amount of produce purchased weekly.

A higher than average number of heavy and medium purchasers indicated two people between 13 and 19 years of age living in the household. Combining earlier responses shows 71% of the heavy purchaser households with children under 19 years of age living in the household. This compares to 53% of medium and 46% of light produce purchaser households with children of the same ages. This is additional evidence of a correlation between children in the household and increased purchase of fresh fruits and vegetables.

Respondents in the light produce purchaser category reported a higher percentage of households with people between 20 and 29 years of age than either heavy or medium produce purchaser categories. For this survey population, households with people between 20 and 29 years of age are much more likely to be light produce purchasers than heavy produce purchasers (38 vs. 15%).

Thirty-six percent of respondents across all produce purchase categories indicate they live in households with people between 30 and 39 years of age. Combined responses indicate that 58% of the heavy produce purchasers live in households with people between 20 and 39 years of age. It is likely these are the parents of the children noted earlier.

Over 36% of the heavy and medium produce purchasers indicate at least one person between 40 and 49 years of age in the household. In both situations, the percentage of households with two people in that age range is greater than households reporting one person of that age, and greater than the average of the survey population.

Across the survey population, 18% of the households have at least one person between 50 and 59 years of age. Heavy purchasers report a higher percentage of this age group (22%) than either medium or light purchasers.

Eighty-one percent of respondents report no one 60 years of age or older living in their household. The percentage of households with people over 60 years of age is similar to households with children under five years of age (19 and 20%).

Crosstab Analysis

In addition to general frequencies for the survey population and specific frequencies for heavy, medium, and light produce purchasers, the relationship between various dependent and independent variables was analyzed using the crosstab function of SPSS for Windows. The results of crosstab analysis are presented in the following discussion, which refers to crosstab tables provided in Appendix C. The page number of the crosstab table referred to in the discussion is identified in parenthesis.

Chemical Pesticides in Food

The first set of crosstabs deals with concern about chemical pesticides in food as influenced by a number of independent variables. Respondents who are likely to avoid buying fruits and vegetables grown in certain countries (page 99) are more likely to be very

concerned about chemical pesticides in food than the average of the survey population (57 vs. 41%). The percentage of respondents very concerned about chemical pesticides in food who indicate they avoid buying fruits and vegetables from certain countries is more than double the percentage of those somewhat concerned or not concerned who avoid buying produce from certain areas. Survey respondents indicate they are more likely to buy fruits and vegetables if they know they are grown in New York (page 99). Of those very concerned about chemical pesticides in food, 80% are more likely to buy produce grown in New York. Two-thirds of those somewhat concerned and even 50% of those not concerned about chemical pesticides in food indicate they are more likely to buy produce grown in New York.

Among those indicating they are very concerned about chemical pesticides in food, 50% indicate they have used pesticides in their home, lawn or garden (page 100). As concern about chemical pesticides in food decreases from very concerned to somewhat concerned, the percentage of respondents who have used pesticides in their home, lawn, or garden increases. Awareness of IPM was highest among those indicating they are very concerned about chemical pesticides in food (page 100).

Respondents who are very concerned about chemical pesticides in food are much more likely to accept blemishes for pesticide-free produce (page 101) than those who are not concerned (70 vs. 31%). Willingness to accept blemishes for IPM grown fruits and vegetables (page 101) is also dependent on concern about chemical pesticides in food. Those very or somewhat concerned about chemical pesticides will accept blemishes for IPM grown fruits and vegetables more readily than those not concerned about chemical pesticides. Using concern about chemical pesticides in food as the constant variable, there is not a meaningful

difference between those willing to accept blemishes for pesticide-free produce or IPM grown fruits and vegetables.

Willingness to pay more for either pesticide-free or IPM grown fruits and vegetables (page 102) is very similar among those very concerned and somewhat concerned about chemical pesticides in food. The percentage willing to pay more for pesticide-free or IPM grown produce among those not concerned about chemical pesticides in food is much lower, although 44% of the not concerned indicated they would be willing to pay more for IPM grown produce. Only 25% of those not concerned indicated they would pay more for pesticide-free fruits and vegetables.

The majority of respondents in this survey population indicate they would pay up to nine percent more (page 103) for either pesticide-free or IPM grown fruits and vegetables. Among those willing to pay up to nine percent more, the degree of concern about chemical pesticides in food appears to have little influence on willingness to pay that much more. Among respondents willing to pay between 10 and 24% more, the percentages willing to pay that much more for pesticide-free are very similar to the percentage willing to pay that much more for IPM grown. Again, degree of concern about chemical pesticides in food appears to have little influence on willingness to pay the higher premium. Similar percentages of the very concerned and somewhat concerned were willing to pay 25% or more for both pesticide-free and IPM grown. Those not concerned about chemical pesticides in food were not willing to pay 25% or more for either pesticide-free or IPM grown fruits and vegetables.

Those very concerned about chemical pesticides in food are most likely to purchase IPM grown fruits and vegetables (page 104). As concern about chemical pesticides in food decreases, the likelihood of buying IPM grown fruits and vegetables decreases;

however, 50% of those indicating they were not concerned about chemical pesticides in food reported they were more likely to purchase IPM grown produce.

Among those very concerned about chemical pesticides in food, 41% are heavy produce purchasers (page 104). Light produce purchasers are the largest percentage of those not concerned about chemical pesticides (44%). Those somewhat concerned about chemical pesticides are fairly evenly distributed among heavy, medium, and light produce purchasers.

Among the ethnic identities represented in the survey population (page 105), Hispanic and African-American respondents are more likely to be very concerned about chemical pesticides in food (60 and 54%). Asians are evenly split between very and somewhat concerned and the majority of Whites are somewhat concerned. People who grew up in rural areas (page 106) are most likely to indicate they are not concerned about chemical pesticides in food. Those indicating they are very or somewhat concerned about chemical pesticides are evenly distributed among those growing up in the city, suburbs, and rural areas. Among those indicating they are very or somewhat concerned about chemical pesticides in food, 64% now live in the suburbs (page 106). Rural residents are the second largest percentage among the very concerned and city dwellers the second largest percentage among those somewhat concerned about chemical pesticides in food.

Across all households and among different age groups respondents are concerned about chemical pesticides in food (page 107). Respondents with children under five years of age in the household indicate they are either very or somewhat concerned about chemical pesticides in food (98%). Those with children between five and 12 years of age exhibit similar concerns; however, the percentage indicating they are very concerned about chemical

pesticides is smaller than those with children under five years of age (30 vs. 39%). Respondents with children between 13 and 19 years of age also indicate they are either very or somewhat concerned about chemical pesticides. As was shown by those with children between five and 12 years of age, those in households with children between 13 and 19 years of age indicating they are very concerned about chemical pesticides is lower than in households with children under five years of age (24 vs. 39%). Respondents in households with people between 30 and 39 years of age also indicate they are very or somewhat concerned about chemical pesticides in food (96%). Those indicating they are very concerned is almost the same as observed in households with children under five years of age (37 vs. 39%). Similar concerns are reported from those in households with people between 40 and 49 years of age with a higher percentage being very concerned about chemical pesticides than in households with children between five and 19 years of age. The same concerns are evident in households with people over 60 years of age, and the percentage of respondents very concerned about chemical pesticides in food is equal to households with children under five years of age.

Pesticide Residues as a Health Hazard

The following crosstabs report concern about pesticide residues in food as a health hazard as influenced by a number of independent variables. Among those indicating that pesticide residues in food are a serious health hazard to consumers, 65% avoid buying fruits and vegetables grown in certain countries (page 108). As concern about pesticide residues as a health hazard decreases, the percentage of respondents not buying fruits and vegetables from certain areas decreases, with only 41% of those rating pesticide residues a moderate

health hazard indicating they avoid buying produce from certain countries. Two of three respondents indicating that pesticide residues were not likely present on food when purchased reported they avoid buying fruits and vegetables from certain countries. The reasons for those decisions are unclear, but appear unrelated to concern about pesticide residues. There is strong support for purchasing fruits and vegetables grown in New York (page 108) across the survey population (70%). As concern about pesticide residues in food decreases to either not a hazard or not likely to be present, the likelihood of buying fruits and vegetables grown in New York decreases, but even those who indicate pesticide residues are not a health hazard (62%) are more likely to buy produce grown in New York. Those indicating that pesticide residues were not likely present in foods at the time of purchase are the only group not likely to purchase fruits and vegetables grown in New York (68%).

Respondents ranking pesticide residues in food a serious health hazard are less likely to have used chemical pesticides in their home, lawn, or garden than those indicating pesticide residues are not a health hazard (page 109). Those who have used chemical pesticides in their home, lawn, or garden are more likely to rate pesticide residues in food a moderate, small, or non-existent health hazard. Awareness of IPM (page 109) is lowest among those considering pesticide residues in food a serious health hazard and highest among those not considering pesticide residues in food a health hazard. It should be noted that IPM awareness among the survey population (19%) was low regardless of degree of concern about pesticide residues in food.

Those ranking pesticide residues in food a serious or moderate health hazard are more willing to accept blemishes for pesticide-free fruits and vegetables than the average of the survey population (page 110). Those ranking pesticide residues a small or non-existent

health hazard are less willing to accept blemishes for pesticide-free fruits and vegetables. Of those unwilling to accept blemishes for pesticide-free produce, 47% consider pesticides used in food production a serious or moderate health hazard. Those concerned about pesticide residues as a health hazard are also willing to accept blemishes for IPM grown fruits and vegetables (page 110). Those who do not consider pesticide residues in food a health hazard are less willing to accept blemishes for IPM grown. Using concern about pesticide residues as a health hazard as the constant variable, there is not a meaningful difference between those willing to accept blemishes for pesticide-free produce or IPM grown fruits and vegetables.

Willingness to pay more for either pesticide-free or IPM grown fruits and vegetables does not appear to be strongly influenced by perceptions about pesticide residues in food as a health hazard (page 111). A majority of the survey population indicates they will pay more for either pesticide-free or IPM grown produce; however, the percentage of those rating pesticide residues a serious hazard who will pay more for pesticide-free is higher than the percentage that will pay more for IPM grown (83 vs.75%). Among respondents rating pesticide residues a moderate health hazard or lower, the percentage willing to pay more for pesticide-free or IPM grown is very similar.

The majority of respondents in this survey population are willing to pay up to nine percent more for either pesticide-free or IPM grown fruits and vegetables. Respondents perceptions of pesticide residues as a health hazard (page 112) appear to have little influence at the nine percent premium level. In fact, the percentage of those rating pesticide residues a small or non-existent health hazard that would pay up to nine percent more for pesticide-free or IPM grown produce is equal or higher than those rating pesticide residues a serious or moderate health hazard. Of respondents rating pesticide residues as a serious or moderate

health hazard, the percentage willing to pay between 10 and 24% more for either pesticide-free or IPM grown is very similar. Likewise, a similar, though small, number of those rating pesticide residues a serious or moderate health hazard would pay 25% or more for both pesticide-free and IPM grown. Those who are not concerned about pesticide residues as a health hazard are not willing to pay a premium of 25% or more.

Concern about pesticide residues in food does not, of itself, make respondents more likely to purchase IPM grown produce (page 113). Most respondents, regardless of their concern about pesticide residues in food, indicated they would be more likely to purchase IPM grown produce. Even 75% of those who do not think pesticide residues are a health hazard indicated they would be more likely to buy IPM grown produce.

The percentage of heavy, medium, and light purchasers (page 113) who consider pesticide residues in food either a serious or moderate health hazard are similar. The percentage of produce purchasers indicating that pesticide residues are a serious health hazard increases as produce purchases increase from light to medium and heavy. Light purchasers are more likely to rate pesticide residues in food a moderate health hazard.

African-American, Hispanic, and Asian respondents are more likely to rate pesticide residues in food a serious health hazard than the average of the survey population (page 114). Whites and African-Americans rating pesticide residues a moderate health hazard was at the average of the survey population. Hispanics and Asians rating pesticide residues a moderate health hazard are below the average of the survey population. Respondents who grew up in the city (page 115) are more likely to rate pesticide residues in food a serious health hazard than those growing up in the suburbs or rural areas. Where respondents reside (page 117) does not appear to have great influence on their perceptions of pesticide residues as a health

hazard, as city, suburban, and rural respondents' ratings of pesticide residues as a health hazard are very close to the average of the survey population

Over 67% of respondents with children in the household under five years of age rate pesticide residues in food as either a serious or moderate health hazard (page 116). Of those, a materially higher percentage rated pesticide residues a moderate health hazard than a serious health hazard (47 vs. 21%). Those with children between five and 12 years of age are more divided in their concern about pesticide residues as a health risk with more indicating pesticide residues are not a health hazard than a serious health hazard (23 vs. 19%). The percentage of respondents with children between five and 12 years of age indicating that pesticide residues are either a serious or moderate health hazard was the same as those indicating that pesticide residues are either a small health hazard or not a health hazard. Respondents from households with children between 13 and 19 years of age are also evenly divided in their opinions about pesticide residues with 50% indicating that residues are either a serious or moderate health hazard, and 50% indicating that residues are either a small health hazard or not a health hazard. Respondents from households with people between 30 and 39 years old are most likely to rate pesticide residues in food a moderate health hazard, followed by serious and small health hazard. Households with people between 40 and 49 years of age are most likely to indicate that pesticide residues are a moderate health hazard, followed by small health hazard and not a health hazard. Only 14% of households with people between 40 and 49 years of age indicated that pesticide residues are a serious health hazard. Households with people over 60 years of age rated pesticide residues in food a moderate health hazard (39%), followed by not a health hazard (23%).

Pesticides and Environmental Contamination

The third set of crosstabs examine concern about pesticides used in food production as environmental contamination as influenced by a number of independent variables. While the survey population does not avoid buying fruits and vegetables grown in certain countries (page 117), those rating pesticides used in food production as a serious environmental contaminant are more likely to not purchase produce grown in certain countries (41vs. 53%). The percentage rating pesticides as a moderate environmental contaminant indicating they avoid buying produce from certain countries is at the average of the survey population. Respondents rating pesticides as a serious, moderate, or small environmental contaminant are more likely to purchase fruits and vegetables grown in New York (page 117). Only those rating pesticides an unlikely environmental contaminant are not more likely to purchase produce grown in New York.

Respondents who have used pesticides in their home, lawn, or garden (page 118) are less likely to consider pesticides a serious environmental contaminant than those who have not used pesticides (46 vs. 54%). Forty-two percent of those who have not used pesticides in their home, lawn, or garden indicate that pesticides are a serious environmental contaminant; an equal percentage of those who have used pesticides rate them as a moderate environmental contaminant. Seventy percent of those who have used pesticides rate them a moderate or small environmental contaminant compared to 51% of those not using pesticides. Among those aware of IPM (page 118), respondents indicating that pesticides used in the production of food are a serious environmental contaminant were the highest percentage (38%).

Those rating pesticides used in the production of food a serious or moderate environmental contaminant are more willing to accept blemishes for pesticide-free fruits and vegetables (page 119), and represent 75% of those who would accept blemishes. Respondents rating pesticides a small environmental contaminant or not likely to cause a problem, are less willing to accept blemishes for pesticide-free produce (23%). Of those not willing to accept blemishes for pesticide-free fruits and vegetables, 55% indicate that pesticides used in the production of food are either a serious or moderate environmental contaminant. Willingness to accept blemishes for IPM grown produce (page 119) is influenced by concern about pesticides as an environmental contaminant. Seventy-three percent of those indicating pesticides used in the production of food are either a serious or moderate environmental contaminant would accept blemishes for IPM grown fruits and vegetables. Of those indicating that pesticides are a small environmental contaminant, 55% are willing to accept blemishes for IPM grown produce.

Willingness to pay more for either pesticide-free or IPM grown fruits and vegetables (page 120) is highest among those respondents rating pesticides as a serious or moderate environmental contaminant, with the percentage rating pesticides a moderate environmental contaminant slightly higher. Respondents rating pesticides as a serious or moderate environmental contaminant and willing to pay more for pesticide-free or IPM grown produce were more than 50% of the survey population. Among those respondents rating pesticides as a small or unlikely environmental contaminant, a higher percentage was willing to pay more for IPM grown than pesticide-free fruits and vegetables (40 vs. 27%).

Concern about pesticides as an environmental contaminant appears to have little influence on how much more respondents are willing to pay for either pesticide-free or IPM

grown produce (page 121). A strong majority will pay up to nine percent more for either pesticide-free or IPM grown fruits and vegetables, and this carries through even to those respondents rating pesticides as a small environmental contaminant or less. Among respondents rating pesticides as a serious environmental contaminant, a higher percentage will pay between 10 and 24% more for pesticide-free and IPM grown produce than among those who perceive pesticide residues as a serious health hazard (18 vs. 9%).

There is not a great deal of difference in the likelihood of buying IPM grown fruits and vegetables (page 122) among those indicating pesticides are a serious, moderate, or small environmental contaminant. Even 60% of those indicating that pesticides used in the production of food were either not a problem or not likely to be an environmental contaminant were more likely to buy IPM grown fruits and vegetables.

Almost 70% of the heavy produce purchasers indicated that pesticides used in the production of food are either a serious or moderate environmental contaminant (page 122). A similar number of light produce purchasers share that opinion. Concern about pesticides and environmental contamination increases slightly as weekly produce purchases increase.

African-Americans, Hispanics and Asians are more likely to rank pesticides used in the production of food a serious environmental contaminant than Whites (page 123). Asians were less likely to consider pesticides a moderate environmental contaminant than Whites, African-Americans and Hispanics. Asians were also most likely to indicate that pesticides used in the production of food are a small environmental contaminant (37%), followed by Whites, African-Americans, and Hispanics. The percentage of people rating pesticides a serious environmental contaminant is larger for those growing up in rural areas than in the city or suburbs (page 124). Most people who grew up in the city or suburbs rate pesticides

used in the production of food a moderate environmental contaminant. People who now live in rural areas are more likely to rate pesticides a serious environmental contaminant than those living in the city or suburbs (page 124). This may be due to their proximity to production agriculture and increased awareness of potential problems resulting from heavy reliance on agrichemicals. People living in the city or suburbs are more likely to rate pesticides a moderate environmental contaminant than those living in rural areas.

Seventy-four percent of respondents from households with children under five years of age indicate that pesticides used in the production of food are a serious or moderate environmental contaminant (page 125). Fewer respondents from households with children between five and 12 years of age rank pesticides a serious environmental contaminant (24%). In these households, the percentage ranking pesticides a moderate environmental contaminant is equal to households with children under five years of age, and the percentage ranking pesticides a small environmental contaminant is higher. There are higher concerns about pesticides as environmental contaminants in households with children between 13 and 19 years of age, with the largest increase in the percentage considering pesticides a moderate environmental contaminant (51%). Respondents from households with people between 30 and 39 years of age are evenly divided in their concern about pesticides as serious or moderate environmental contaminants. Respondents from households with people between 40 and 49 years of age are more likely to rate pesticides a moderate environmental contaminant. The percentage of respondents from households with people over 60 years of age rating pesticides a serious environmental contaminant was the lowest of any age group (16%). Almost 43% of this age group indicated that pesticides used in the production of

food are either a small environmental contaminant, not a problem, or unlikely to be an environmental contaminant.

Ethnic Identity

The next series of crosstabs looked at the influence of ethnic identity on responses to a number of independent variables. Hispanics and Asians are more likely to accept blemishes for pesticide-free fruits and vegetables than Whites and African-Americans (page 126). The percentage of Whites and African-Americans willing to accept blemishes for pesticide-free fruits and vegetables was below the average of the survey population (62%). Hispanics and Asians are most likely to accept blemishes for IPM grown fruits and vegetables (page 126). Whites were at the average of the survey population, and African-Americans were much less likely to accept blemishes for IPM grown.

The percentage of Asians and African-Americans willing to pay more for pesticide-free produce was higher than the average of the survey population (page 127). Whites and Hispanics are less willing to pay more for pesticide-free fruits and vegetables than the average of the survey population. Asians are more willing to pay more for pesticide-free fruits and vegetables than other ethnic groups. All ethnic groups represented in this survey will pay more for IPM grown fruits and vegetables with Asians and Whites willing to pay more than Hispanics and African-Americans (page 127).

A majority of the survey population will pay up to nine percent more for pesticide-free and IPM grown fruits and vegetables (page 128). One-third of Asian respondents would pay between 10 and 24% more for pesticide-free, and 11% would pay 25% or more. Twenty-three percent of Whites and 10% of African-Americans would pay between 10 and

24% more for pesticide-free. Hispanics will not pay more than nine percent more for pesticide-free fruits and vegetables. Thirty-one percent of Asians, 25% of Hispanics, and 22% of Whites will pay between 10 and 24% more for IPM grown produce. African-Americans will not pay more than nine percent more for IPM grown fruits and vegetables. There is reluctance among all ethnic groups represented in the survey population to pay more than a 25% premium for either pesticide-free or IPM grown fruits and vegetables.

The percentage of Asians likely to go to another store for organic produce was higher than the average of the survey population (page 129). For other ethnic groups, most were somewhat or not likely to go to another store for organic produce. Overall, the ethnic groups represented in this survey are not likely to go to another grocery store for IPM grown fruits and vegetables (page 129). The ethnic groups represented in this survey are more likely to purchase IPM grown fruits and vegetables than standard produce (page 130). All Asian and Hispanic respondents indicated a positive response.

Level of Education

The influence of different levels of education on responses to a number of independent variables is presented in the next set of crosstabs. While the survey population does not avoid buying fruits and vegetables grown in certain countries, high school graduates and those with some post-graduate work are more likely to not buy fruits and vegetables from certain growing areas (page 131). Survey respondents are more likely to buy fruits and vegetables if they know they are grown in New York (page 131). Those with the highest level of education (post-graduate) are the least likely to buy produce grown in New York (55%).

Awareness of the names of chemical pesticides (page 132) is lowest among high school graduates, highest among those with some post-graduate work, and close to the average for vocational or technical and college graduates.

Vocational or technical graduates are most likely to have used chemical pesticides in their home, lawn, or garden (page 132). High school graduates are least likely to have used chemical pesticides and college graduates and those with some post-graduate work are at the average of the survey population. Vocational or technical graduates are most likely to have experience with biological or natural pesticides (page 133). College graduates had the lowest positive response of those who have used biological or natural pesticides in their home, lawn, or garden.

Education does influence concern about chemical pesticides in food (page 133). Vocational or technical graduates are least likely to be very concerned about chemical pesticides in food. High school and college graduates are 69% of those very concerned about chemical pesticides in food, and an almost equal percentage of high school and college graduates indicate they are somewhat concerned about chemical pesticides.

High school graduates and those with some post-graduate work are more likely to consider pesticide residues in food a serious health hazard than vocational or technical and college graduates (page 134). Those with some post-graduate work are the only educational group with more respondents rating pesticides a serious health hazard than a moderate health hazard.

Among different educational levels, those rating pesticides used in the production of food a serious or moderate environmental contaminant are evenly distributed (page 135). Vocational and technical graduates are not as likely to rank pesticides as serious

environmental contaminants as the other educational groups (17 vs. 31%). Vocational and technical graduates are more likely to rank pesticides a moderate environmental contaminant than others (51 vs. 37%).

Household Income

The influence of household income on responses to a number of independent variables is assessed in the next crosstabs. Households with income below $20,000 or over $59,999 are most likely to not buy fruits and vegetables grown in certain countries (page 136). Of the households that avoid buying fruits and vegetables from certain countries, 34% had income greater than $59,999. All income groups indicated they would be more likely to buy fruits and vegetables grown in New York (page 137). Households with income between $50,000 and $59,999 are above the average of the survey population (82 vs. 70%).

Thirty-three percent of those very concerned about chemical pesticides in food had household income greater than $59,999 (page 138). Only seven percent of those very concerned about chemical pesticides had income below $20,000. There was a fairly even distribution among the different income groups of those somewhat concerned about chemical pesticides in food. Of those not concerned about chemical pesticides in food, 56% had household income greater than $59,999.

Forty-three percent of those rating pesticide residues in food a serious health hazard had household income greater than $49,999 (page 139). Among the survey population, those with income below $30,000 are more likely to rate pesticide residues a serious or moderate health hazard than those with income greater than $29,999. Except for those with income

between $50,000 and $59,999, respondents with household income greater than $29,999 are most likely to rate pesticide residues a moderate or small health hazard.

Across all income groups, respondents rating pesticides used in the production of food a serious or moderate environmental contaminant are close to the average of the survey population (page 140). The percentage in the $50,000 to $59,999 income group indicating that pesticides are a serious or moderate environmental contaminant was higher than the average of the survey population.

For this survey population, 63% will accept blemishes for pesticide-free fruits and vegetables (page 141). Those with income over $39,999 reported a higher than average willingness to accept blemishes for pesticide-free produce. While all income groups, as the survey population, will accept blemishes for IPM grown (page 142) fruits and vegetables, those with income below $40,000 are less willing to accept blemishes for IPM grown than those with incomes over $39,999.

All income groups will pay more for pesticide-free fruits and vegetables; however, the $30,000 to $39,999 group was less willing to pay more than others (page 143). The percentage of respondents with income greater than $59,999 willing to pay more was higher than the average of the survey population (81 vs. 73%). Respondents will pay more for IPM grown fruits and vegetables (page 144), but those with income under $30,000 are less willing to pay more than other income groups and below the average of the survey population. At income greater than $29,999, the percentage of households willing to pay more for IPM grown fruits and vegetables was higher than those willing to pay more for pesticide-free fruits and vegetables.

While all income groups indicated they would pay up to nine percent more for pesticide-free produce (page 145), the percentage with income below $20,000 or over $59,999 is below the average of the survey population. At the same time, both those income groups had a higher than average percentage willing to pay between 10 and 24% more for pesticide-free fruits and vegetables. Respondents with household income greater than $59,999 represented 35% of those willing to pay between 10 and 24% more for pesticide-free fruits and vegetables. Respondents are generally willing to pay up to nine percent more for IPM grown fruits and vegetables (page 146). Twenty-three percent are willing to pay between 10 and 24% more and those with income under $20,000 are above the average of the survey population (31 vs. 23%). As with pesticide-free fruits and vegetables, the percentage of those with income below $20,000 or over $59,999 willing to pay between one and nine percent more is below the average of the survey population.

Income is not likely to be a factor that would cause someone to go to another grocery store for organically grown fruits and vegetables or fruits and vegetables grown with IPM practices (pages 147 and 148).

All income groups indicated they are more likely to purchase IPM grown fruits and vegetables (page 149); however, those with income below $20,000 are less likely to purchase IPM grown produce than the average of the survey population (76 vs. 88%).

Produce consumption and weekly purchases tend to increase as household income increases (page 150). Households with income below $20,000 are most likely to be light to medium produce purchasers. Households with income greater than $59,999 are most likely to be medium to heavy produce purchasers. The percentage of heavy produce purchasers earning less than $20,000 is about the same as light purchasers earning more than $59,999.

Age

The final crosstabs report the influence of age on responses to a number of independent variables. Across all age groups (page 151), more respondents are somewhat concerned about chemical pesticides in food than very concerned (58 vs. 36%). For respondents 30 years of age and older, the percentage of those very concerned about chemical pesticides in food is close to or just above the average of the survey population (36%). The percentage of those very concerned about chemical pesticides under 30 years of age is below the average.

Most respondents rank pesticide residues in food a moderate health hazard (page 152) with those in the 20 to 29 year old group and over 69 years of age above the average of the survey population (52 and 56%). Of those rating pesticide residues a serious health hazard, the largest percentage are 30 to 39 years of age (36%).

For this survey, the percentage ranking pesticides used in food production a serious environmental contaminant (page 153) is higher than those indicating that pesticides are a serious health hazard (31 vs. 22%). The percentage of people 60 years of age and older ranking pesticides a serious environmental contaminant is below the average of the survey population. People over 69 years of age are more likely than other age groups to rank pesticides a small environmental contaminant (38 vs. 25%).

Willingness to accept blemishes for pesticide-free fruits and vegetables varies with age (page 154). Those in the 19 and under age group are evenly split. People between 20 and 59 years of age will accept blemishes for pesticide-free (67%) and those over 60 years of age are less willing to accept blemishes. Only 28% of respondents 60 to 69 years of age will accept blemishes for pesticide-free produce. Willingness to accept blemishes for IPM grown fruits

and vegetables (page 155) varies with age, as it did with pesticide-free produce. The 19 and under age group was evenly split; those between 20 and 59 years of age are more willing to accept blemishes. Almost 70% of the 30 to 59 year age group will accept blemishes for IPM grown produce. People over 59 years of age are less likely to accept blemishes for IPM grown. That a large percentage of respondents between 20 and 60 years of age will accept blemishes for IPM grown fruits and vegetables has favorable implications for the Wegmans IPM project, as they are likely to be long-term Wegmans customers.

Age does not have a great influence on willingness to pay more for pesticide-free fruits and vegetables (pages 156). Those 60 to 69 years of age had the lowest percentage of positive responses, but still indicated that 50% would pay more for pesticide-free fruits and vegetables. Respondents between 20 and 59 years of age indicated a strong willingness to pay more for IPM grown fruits and vegetables (page 157). People under 19 years of age and over 59 years of age are not as willing to pay more as the other age groups. As with the willingness to accept blemishes, the willingness to pay more for IPM grown produce has positive implications for the Wegmans IPM project.

Across all age groups, respondents will pay up to nine percent more for pesticide-free fruits and vegetables (page 158). The percentage willing to pay between 10 and 24% more for pesticide-free produce decreases rapidly for those 50 years of age and older. All age groups in this survey will pay up to nine percent more for IPM grown fruits and vegetables (page 159). Those willing to pay between 10 and 24% more for IPM grown are evenly distributed among the 20 to 49 year old categories. Age is not a great influence on the likelihood of purchasing IPM grown fruits and vegetables, as there was strong support for IPM grown fruits and vegetables across all ages (page 160).

Chapter IV

Conclusions and Recommendations

American consumers continue to express concern about agrichemical inputs used by growers. This concern is based on perceptions of human health and environmental issues related to the use of pesticides. This study examined the basis of those consumer concerns and analyzed consumer attitudes about pesticides and produce quality, how consumer concerns and attitudes influence grower adoption of IPM practices, and whether a food retailer can facilitate adoption of new technology by agricultural producers.

Purchasing Habits and Decisions

Consumers represented in the current survey population think about where their food is produced before it reaches the grocery store. They do not avoid buying fruits and vegetables grown in certain countries; however, they would be more likely to purchase fruits and vegetables grown in New York State. The strong positive response to purchasing fruits and vegetables grown in New York State is indicative of support for local producers and locally grown products. It is unlikely that carrying either IPM grown or organically grown fruits and vegetables is sufficient reason to cause them to switch to another grocery store, although the survey population indicates they are slightly more likely to switch to another grocery store for fruits and vegetables grown with IPM practices than they are for organically grown fruits and vegetables. They spend $50 or more weekly on groceries, with at least 10% of their grocery dollars spent on fresh fruits and vegetables.

Knowledge or Use of Pesticides

A large percentage of the current survey population knows the names of chemical pesticides and indicates they have used chemical pesticides in their home, lawn, or garden. A smaller percentage uses biological or natural pesticides in their home, lawn, or garden. Among the current survey population, the percentage of those aware of IPM is higher than reported in the results of a 1989 survey (Grant et al., 1990).

Chemical Pesticides, Health Hazards and the Environment

Respondents in the current survey population indicate they are concerned about chemical pesticides in the foods they eat; however, more say they are somewhat concerned than very concerned. When asked about pesticide residues as a health hazard, they perceive residues to be a health hazard; but a greater number consider pesticide residues a moderate health hazard rather than a serious health hazard. The degree of concern expressed about pesticides as a serious or moderate environmental contamination was higher than was expressed about pesticide residues as either a serious or moderate health hazard. This response pattern is very similar to that observed in other studies reported in the literature review. Strong consumer concern about pesticides and the environment indicates that retailer association with environmentally friendly production practices is likely to be viewed favorably by consumers and may well be a means of differentiating one retailer from another. This is further evidence that the course of action undertaken by Wegmans to encourage local growers to adopt IPM practices is appropriate and directionally correct.

Willingness to Accept Blemishes and Pay More for Reduced Pesticides

The current survey population will accept blemishes on fruits and vegetables in exchange for pesticide-free growing practices. If the appearance and quality of the pesticide-free fruits and vegetables were the same as conventionally grown fruits and vegetables, the survey population would pay more for pesticide-free. Most respondents would be willing to pay as much as nine percent more for pesticide-free.

The survey population expressed strong support for IPM, with 89% saying they would be more likely to purchase fruits and vegetables grown with IPM practices than conventionally grown fruits and vegetables if they were available. In addition, respondents will accept blemishes on fruits and vegetables grown with IPM practices. If the appearance and quality of IPM grown fruits and vegetables were the same as conventionally grown, the survey population would pay more for IPM grown. Most respondents would be willing to pay up to nine percent more for IPM grown fruits and vegetables. The percentage of respondents willing to pay more for IPM grown is slightly greater than those willing to pay more for pesticide-free. This information should help increase grower confidence in IPM practices and grower willingness to adopt IPM practices in their operations.

Age Distribution

For the current survey population, most did not have children under five years of age living in the household. The percentage of heavy produce purchaser households with at least one child under five years of age was above the average of the survey population and this is indicative of larger quantities of fresh fruits and vegetables consumed by children. Almost every respondent with children under five years of age indicated they were either very or

somewhat concerned about chemical pesticides in food, with the percentage of somewhat concerned higher than those very concerned. As the age of children in the household increases, the percentage of respondents indicating they are very concerned about chemical pesticides in food decreases.

A smaller number of the survey population with children under five years of age indicate that pesticide residues in food are either a serious or moderate health hazard, with a markedly higher percentage rating pesticide residues as a moderate health hazard than a serious health hazard. As children get older, respondents are more likely to rate pesticide residues in food not a health hazard than a serious health hazard.

Three-quarters of the current survey population with children under five years of age consider pesticides used in food production to be either a serious or moderate environmental contaminant. As shown with concern about chemical pesticides in food and pesticide residues as a health hazard, more respondents rate pesticides as a moderate environmental contaminant than a serious environmental contaminant.

Recommendations

Conversations between the researcher and local growers participating in the IPM training presented by Wegmans and Cornell Cooperative Extension in 1995 document grower willingness to incorporate IPM practices into their operations, or increase the level of IPM implementation already in place. This willingness is tempered by grower concern about consumer acceptance of agricultural crops grown with reduced pesticide applications. Considering consumer concern expressed about pesticides and environmental contamination, this may seem inconsistent; however, fresh market growers are very concerned about the

aesthetic qualities of their crops and hesitant to adopt new technologies that may result in a higher degree of insect damage or blemished product.

As part of the IPM training made available to local growers by Wegmans in 1995, one grower agreed to adopt the complete IPM program for fresh market sweet corn developed by the NYS Integrated Pest Management Program on a portion of their total acreage. For the 1996 season, that grower and three additional growers indicate they will follow the complete IPM program on all their fresh market sweet corn. This represents a substantial increase in fresh market sweet corn produced with IPM practices and means that most of the fresh market sweet corn sold in Wegmans' Rochester market area in 1996 will be IPM grown. It was the intent of the researcher to share the results of the current study with growers and use consumer preference for IPM grown fruits and vegetables, consumer willingness to accept blemishes in exchange for reduced pesticide applications, and consumer willingness to pay more reported in the current study to increase grower confidence in IPM and convince growers that implementing IPM is an option they should consider. Fresh market sweet corn growers supplying Wegmans arrived at that conclusion without benefit of seeing the supporting data; however, those data will prove useful with other growers as Wegmans expands the variety of fruits and vegetables grown with IPM practices offered to consumers.

The current survey population would prefer to purchase IPM grown fruits and vegetables than either conventionally or organically grown, will accept blemishes in exchange for reduced pesticide applications, and is willing to pay more for fruits and vegetables grown with fewer pesticides. All these factors have positive implications for growers considering, or who have already implemented IPM practices into their operations. As was demonstrated by an informal consumer survey at Wegmans' Hylan Drive store in 1995, awareness of IPM and

the benefits of IPM practices is a critical component of consumer support. The Wegmans' Hylan Drive survey reaffirmed information contained in several studies reported in the literature review; once consumers understand IPM and how it benefits the environment, there is overwhelming support for IPM and IPM grown products.

Wegmans' challenge is to develop an education program for IPM that takes a very complicated concept and breaks it down into manageable, understandable pieces. As was reported by Ridgley and Brush (1992), IPM becomes easier for growers to implement when broken down into smaller components. The same needs to be done with IPM as part of a consumer education effort. As shown by Anderson (1994), consumer education about IPM is a long-term process and not to be accomplished in a single season and this should be the approach that Wegmans takes. Wegmans employees play an important role in consumer education, and provide Wegmans the opportunity to present an ongoing information effort that reaches consumers with information about IPM while they shop. As suggested in studies reported in the literature review and confirmed by the informal consumer survey conducted at Wegmans' Hylan Drive store in 1995, having an employee able to talk to consumers about IPM raised consumer awareness and helped increase consumer understanding and support for IPM practices. The researcher recommends that Wegmans educate employees to increase employee knowledge of IPM practices and prepare employees to share information with consumers. In-store brochures and point of purchase signs should be developed as a complement to the employee education effort to inform consumers about IPM practices and further reinforce what benefits consumers can expect from IPM grown fruits and vegetables. A goal of any education effort should be to help consumers understand why IPM is important and why consumers should care. Wegmans has access to thousands of consumers via

television, radio and print media and these present another opportunity to tell the IPM story to consumers. The researcher views the Wegmans' fresh market sweet corn project as a great opportunity to present a positive image of agriculture to the public and give growers credit for the steps they are taking to protect and preserve the environment. With educated employees sharing information about IPM with consumers and backing this effort with in-store brochures, signs and electronic and print media, Wegmans can cultivate consumer demand for fruits and vegetables grown with IPM practices.

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Appendix A

Appendix A contains the cover letter and the survey instrument that was sent to 600 consumers in the Rochester market area in October 1995.

R·I·T

Rochester Institute of Technology

School of Food, Hotel and Travel Management
Department of Graduate Studies
George Eastman Building
10 Lomb Memorial Drive
Rochester, New York 14623-5604
716-475-5666 Fax 716-475-6401

October 16, 1995

Dear Recipient:

I am a graduate student working towards a Master of Science degree in Service Management at the Rochester Institute of Technology. My graduate research will look at consumer attitudes about chemicals used in agricultural production and perceptions of product quality, and how these influence grower willingness to incorporate new technology into their production practices. I am surveying consumers to gather data and am interested in your opinions!

I've enclosed a copy of my survey and a postage-paid return envelope. ***PLEASE COMPLETE AND RETURN THE SURVEY BY NOVEMBER 6, 1995!*** I've also included one dollar, to encourage you to fill out and return the survey. I was going to donate one dollar to a local charity for every returned survey, but the marketing research people I talked to said that enclosing a dollar works better. The survey should take no more that **15 - 20 minutes** to fill out; please enjoy a cup of coffee or a bowl of soup with my compliments while completing the survey.

You will note a three digit control number in the bottom left corner of the front page. This number is to help me track the surveys that are returned, and minimize the number of reminder notices I need to send out. The control number or your name will **not** be entered into the database, and will **not** be connected to your responses in any way when the responses are analyzed. I respect your privacy and appreciate your willingness to share information with me! If you would like a summary of the results of this research, please write your mailing address at the end of the survey. I will be pleased to send you a summary when the analysis is completed.

Thank you in advance for taking time to complete and return this survey. I recognize that your time is valuable and appreciate your participation and help with my research.

Sincerely,

William M. Pool
Graduate Student

Richard F. Marecki, Ph. D.
Chairman, Department of
Graduate Studies

P.S. Your response by November 6, 1995 will be greatly appreciated.

Please read the following statement before completing the rest of this survey....

Integrated Pest Management (IPM) is a crop production program in which a combination of pest control techniques are used. The farmer does not rely completely on the regular scheduled use of chemical pesticides. Other methods are used such as genetically resistant plants, natural enemies and destruction of places where pests breed. Only when those methods fail to control the pests, does the farmer use chemical pesticides as a last resort. With IPM, farmers reduce their use of pesticides by one-third or more.

15. If there were fresh fruits and vegetables available in your local grocery store that were certified as IPM grown, do you think you would be more likely to buy them than standard produce? **Yes_____ No_____**

16. If fresh fruits and vegetables were certified as being IPM grown, would you be willing to accept blemishes such as spots on fruit or holes on leafy vegetables? **Yes_____ No_____**

17. If the appearance and quality of the IPM grown fresh fruits and vegetables were the same as standard produce would you pay more for IPM grown produce? **Yes_____ No_____**

18. If you would be willing to pay more for IPM grown produce, how much more would you pay? **1 - 9%_____ 10 - 24%_____ 25% +_____**

19. How likely would you be to purchase fresh fruits and vegetables from a different grocery store than the one you currently use if the other carried IPM grown produce? **Very_____ Somewhat_____ Not Likely_____**

20. On average, how much do you spend on groceries per week? **$_____**

21. What percent of the amount you spend on groceries do you spend on fresh fruits and vegetables? **_____%**

22. How many people in the following age groups live in your household? **Less than 5 years_____ 5 to 12 years_____ 13 to 19 years_____ 20 to 29 years_____ 30 to 39 years_____ 40 to 49 years_____ 50 to 59 years_____ 60 years or over_____**

23. Which of the following best describes your ethnic identification? **White (Caucasian)_____ Native American (American Indian)_____ Black (African-American)_____ Hispanic_____ Asian_____ Other_____**

24. How would you describe your current place of residence, and where you grew up? **Grew Up....City_____ Suburb_____ Rural_____ Live Now....City_____ Suburb_____ Rural_____**

25. What is the highest level of education you have completed? **High School graduate_____ Vocational or technical school_____ College graduate_____ Post graduate_____**

26. What was your total household income before taxes in 1994? **Less than $19,999_____ $20,000 to 29,999_____ $30,000 to 39,999_____ $40,000 to 49,999_____ $50,000 to 59,000_____ Over $60,000_____**

27. What is your sex? **Male_____ Female_____**

28. What is your age? **19 years or under_____ 20 to 29 years_____ 30 to 39 years_____ 40 to 49 years_____ 50 to 59 years_____ 60 to 70 years_____ Over 70 years_____**

1. Do you think about how or where your food is produced before it reaches the grocery store? **Yes**_____ **No**_____

2. Do you tend to avoid buying fresh fruits and vegetables if you know they are grown in certain countries? **Yes**_____ **No**_____

3. Would you be more likely to buy fresh fruits and vegetables if you knew they were grown in New York? **Yes**_____ **No**_____

4. Are you aware of any names of chemical pesticides? **Yes**_____ **No**_____

5. Have you ever used a chemical pesticide in your home, lawn or garden? **Yes**_____ **No**_____

6. Do you use biological or natural pesticides in your home, lawn or garden? **Yes**_____ **No**_____

7. How concerned are you about the use of chemical pesticides in the food you eat? **Very**_____ **Somewhat**_____ **Not Concerned**_____

8. With which of the following statements about pesticides and consumers do you most agree (**choose only one**)

   a. Pesticide residues remaining in or on food at the time of purchase ...present a serious health hazard to consumers **a**_____
   b. ...present a moderate health hazard to consumers **b**_____
   c. ...present a small health hazard to consumers **c**_____
   d. ...are present in small enough quantities that they do not present a health hazard to consumers **d**_____
   e. There are not likely to be any pesticide residues remaining in or on food at the time of purchase **e**_____

9. With which of the following statements about pesticides and the environment do you most agree (**choose only one**)

   a. Pesticides used in the production of food ...cause serious contamination of the environment **a**_____
   b. ...cause moderate contamination of the environment **b**_____
   c. ...cause a small amount of contamination of the environment **c**_____
   d. ...cause a small amount of contamination of the environment, but this is not a problem **d**_____
   e. ...are not likely to cause contamination of the environment **e**_____

10. If fresh fruits and vegetables were certified as pesticide-free, would you be willing to accept blemishes such as spots on fruit or holes in leafy vegetables? **Yes**_____ **No**_____

11. If the appearance and quality of the pesticide-free fresh fruits and vegetables were the same as produce treated with chemical pesticides, would you pay more for the pesticide-free produce? **Yes**_____ **No**_____

12. If you would be willing to pay more for pesticide-free produce, how much more would you pay? **1 - 9%**_____ **10 - 24%**_____ **25% +**_____

13. How likely would you be to go to another grocery store if it carried organically grown produce? **Very**_____ **Somewhat**_____ **Not Likely**_____

14. Have you ever heard of Integrated Pest Management (IPM)? **Yes**_____ **No**_____

Appendix B

Appendix B contains the Figures referenced in the review of literature.

Figure 1. **Confirmed Pesticide Detections in Groundwater Due to Normal Agricultural Use (Abbreviated List)**

Pesticide	Health Advisory Level[a] (PPB)	States	Median Concentration[b] (PPB)
Alachlor	1.5[c]	CT, FL, IL, IA, KS, LA, MA, ME, NE, PA, WI	0.90
Aldicarb	10.0	CA, FL, MA, NC, NY, RI, WI	9.00
Atrazine	3.0	CA, CO, CT, IL, IA, KS, MD, ME, NE, NJ, PA, VT, WI	0.50
Carbofuran	36.0	MA, NY, RI	5.30
Cyanazine	9.0	IA, LA, MD, NE, PA, VT	0.40
2,4-D	70.0	CT, MS	1.40
Diazinon	0.63	MS	162.00
Dinoseb	7.0	MA, ME, NY	0.70
Ethylene dibromide	0.005[c]	CA, CT, GA, MA, NY, WA	0.90
Malathion		MS	41.50
Methyl parathion	2.0	MS	88.40
Metolachlor	10.0	CT, IL, IA, PA, WI	0.40
Simazine	35.0	CA, CT, MD, NE, NJ, PA, VT	0.30
Toxaphene		MS	3,205.00

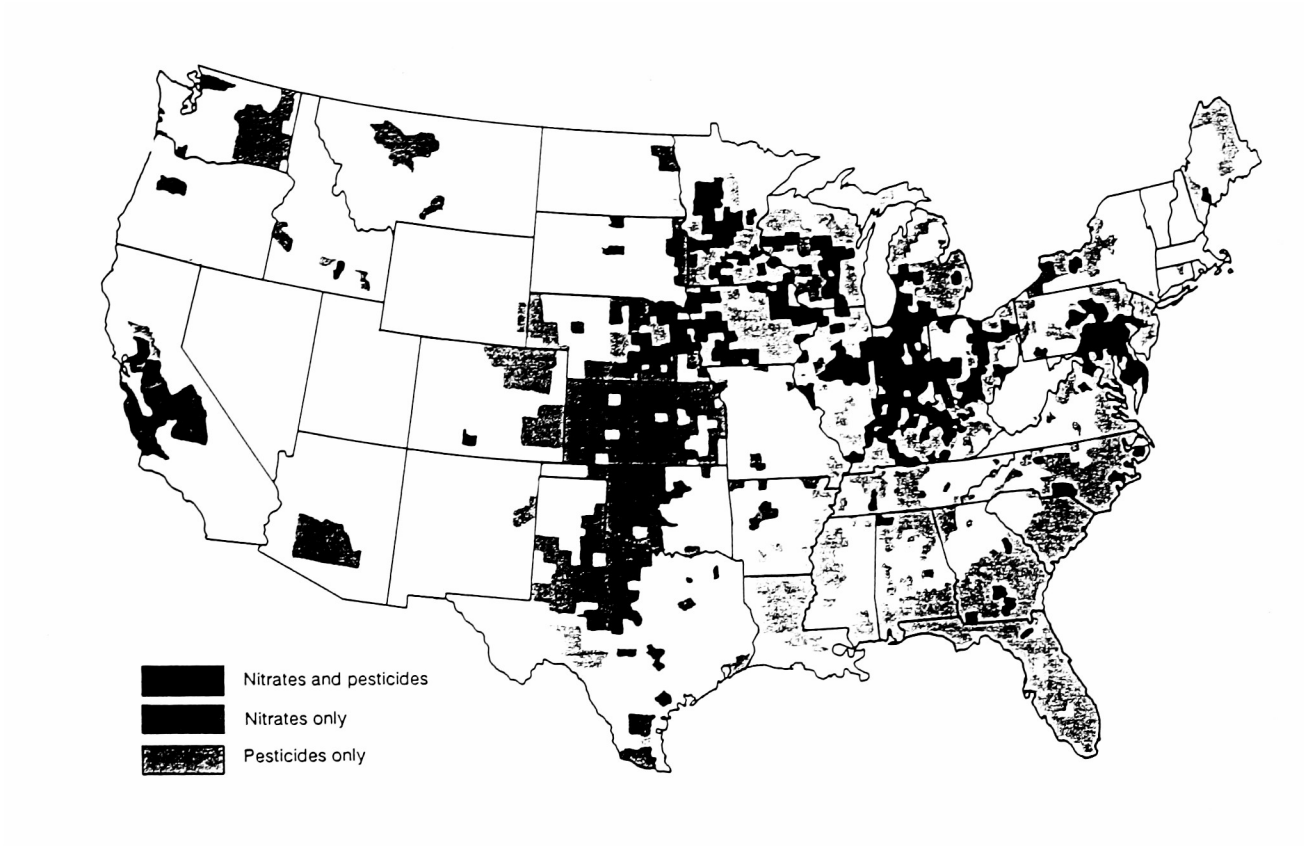
[a] The EPA sets the Proposed Lifetime Health Advisory Level. The EPA has not set levels for all pesticides.

[b] Median of the concentration of positive detections for all confirmed studies. If multiple studies were not done on a particular chemical, the single study average is given. If the data base reports a single positive well, then the average concentration reported for that well is given.

[c] For carcinogens, the Proposed Lifetime Health Advisory Level is based on the exposure levels that present a 1 in a million risk of cancer in the exposed population.

National Research Council, 1989

Figure 2. **Counties With Potential Groundwater Contamination From Agricultural Chemicals (U.S. Department of Agriculture 1987)**



National Research Council, 1989

Figure 3. **Consumer Confidence in Food Safety, 1992 - 1995**

Q. How confident are you that the food in your supermarket is safe? Would you say you are completely confident, mostly confident, somewhat doubtful or very doubtful?

		Completely or Mostly Confident				Jan. 1995				
	Base	Jan. 1992	Jan. 1993	Jan. 1994	Jan. 1995	Com-pletely con-fident	Mostly con-fident	Some-what Doubt ful	Very Doubt ful	Not Sure
		%	%	%	%	%	%	%	%	%
Total	1,011	72	73	73	↑77	14	↑63	↓19	2	1
Gender										
Men	317	74	75	76	79	15	64	18	2	1
Women	694	71	72	72	↑77	14	↑63	↓20	2	1
Age										
18-24	73	69	77	70	77	22	55	19	3	1
25-39	328	75	73	73	75	11	64	22	2	1
40-49	197	66	70	71	↑81	13	↑68	↓15	4	1
50-64	190	66	69	72	75	12	63	23	2	1
65/older	133	79	79	75	82	21	↑61	16	1	2
Region										
East	217	68	68	71	76	11	65	21	2	1
Midwest	290	75	80	73	↑80	13	66	18	1	1
South	247	72	70	69	↑76	17	59	21	1	2
West	257	71	71	79	77	14	63	19	3	2

↑ ↓ = Percentage is significantly higher or lower than 1994 percentage

Food Marketing Institute, 1995 Trends

Figure 4. **Consumer Concern About Selected Food Attributes, 1992 - 1995**

Q. I'm going to read a list of food items that may or may not constitute a health hazard. For each one, please tell me if you believe it is a serious health hazard, somewhat of a hazard, or not a hazard at all. Base: 1,011 shoppers

	Serious Hazard			1995			
	Jan. 1992	Jan. 1993	Jan. 1994	Serious Hazard	Some what of a Hazard	Not a Hazard At All	Not Sure
	%	%	%	%	%	%	%
Contamination by bacteria or germs	x	x	x	76	19	4	2
Residues, such as pesticides and herbicides	76	79	72	74	20	3	3
Product tampering	x	x	x	58	28	11	4
Antibiotics and hormones in poultry and livestock	53	55	50	52	33	7	8
Irradiated foods	35	35	38	↓30	24	12	35
Nitrites in foods	40	35	34	↓28	38	6	29
Additives and preservatives	26	23	25	↓22	60	14	4
Foods produced by biotechnology	x	x	x	14	32	16	38

x = not asked

↑↓ = Percentage is significantly higher or lower than 1994 percentage

Food Marketing Institute, 1995 Trends

Figure 5. **Perceived Threats to Food Safety by Gender and Education**

Q. What, if anything, do you feel are the greatest threats to the safety of the food you eat? (Verbatim responses coded to categories below. Multiple responses accepted.)

				Gender		Household Income	
	Jan. 1993 Total	Jan. 1994 Total	Jan. 1995 Total	Men	Women	$35k or less	$35k or more
Base	1,006	1,008	1,011	317	694	427	395
Freshness/code dates	20	16	↑22	↑18	↑24	25	21
Bacteria/contamination	8	10	↑15	↑16	↑15	12	18
Spoilage/germs	18	10	↑14	↑15	↑13	11	17
Pesticides/residues insecticides, herbicides	13	14	15	15	15	13	18
Chemicals	8	12	11	10	11	9	12
Unsanitary handling by supermarket employees	10	8	11	8	↑12	7	9
Processing/preparation	12	11	↓8	8	↑8	8	14
Preservatives	6	7	6	6	6	7	6
Improper packaging/canning	13	5	6	6	6	7	6
Tampering	7	4	4	6	3	4	5
Pollution/environmental pollution	2	3	2	2	2	3	2
Biotechnology	x	x	*	*	*	x	x
Irradiation	x	x	*	*	x	x	x

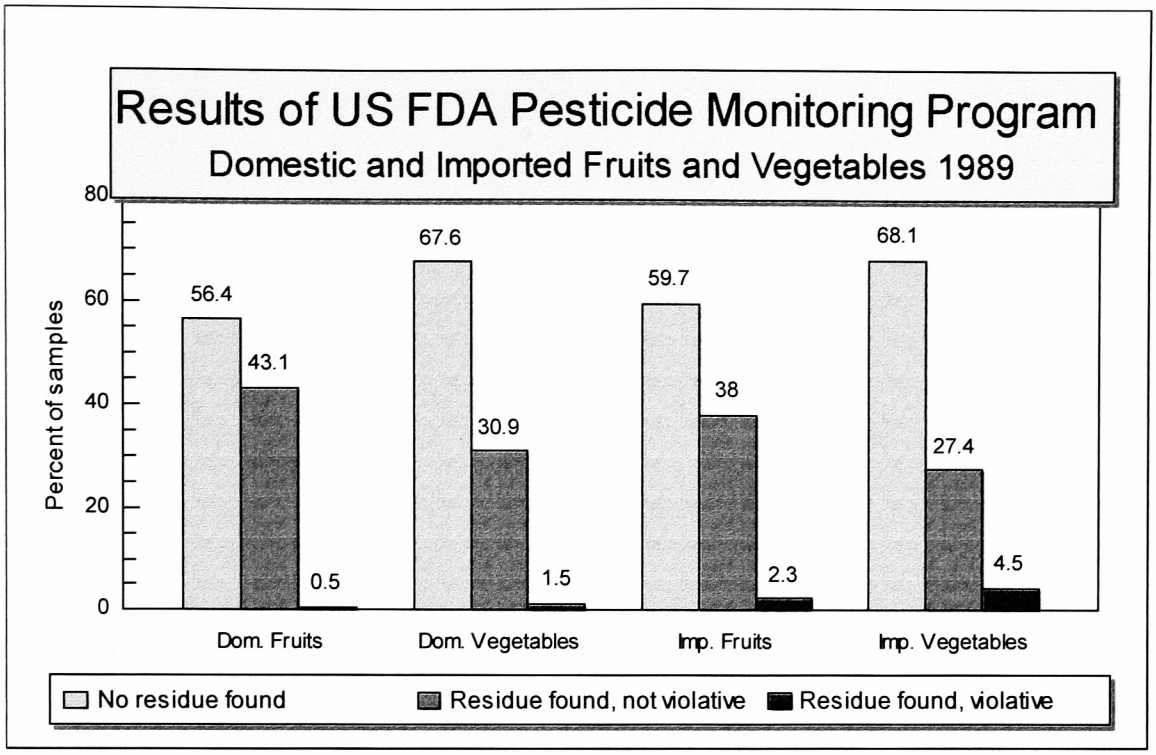
x = not mentioned

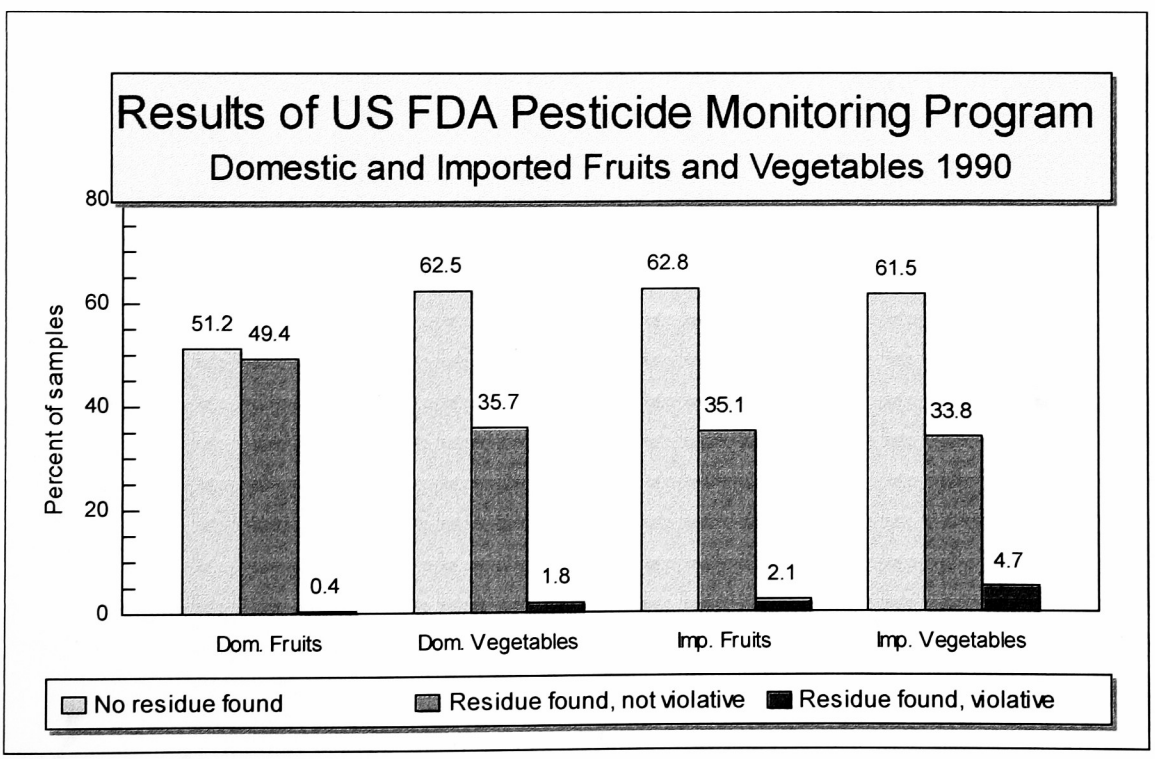
* = Less than 0.5 percent

↑↓ = Percentage is significantly higher or lower than 1994 percentage

Food Marketing Institute, 1995 Trends

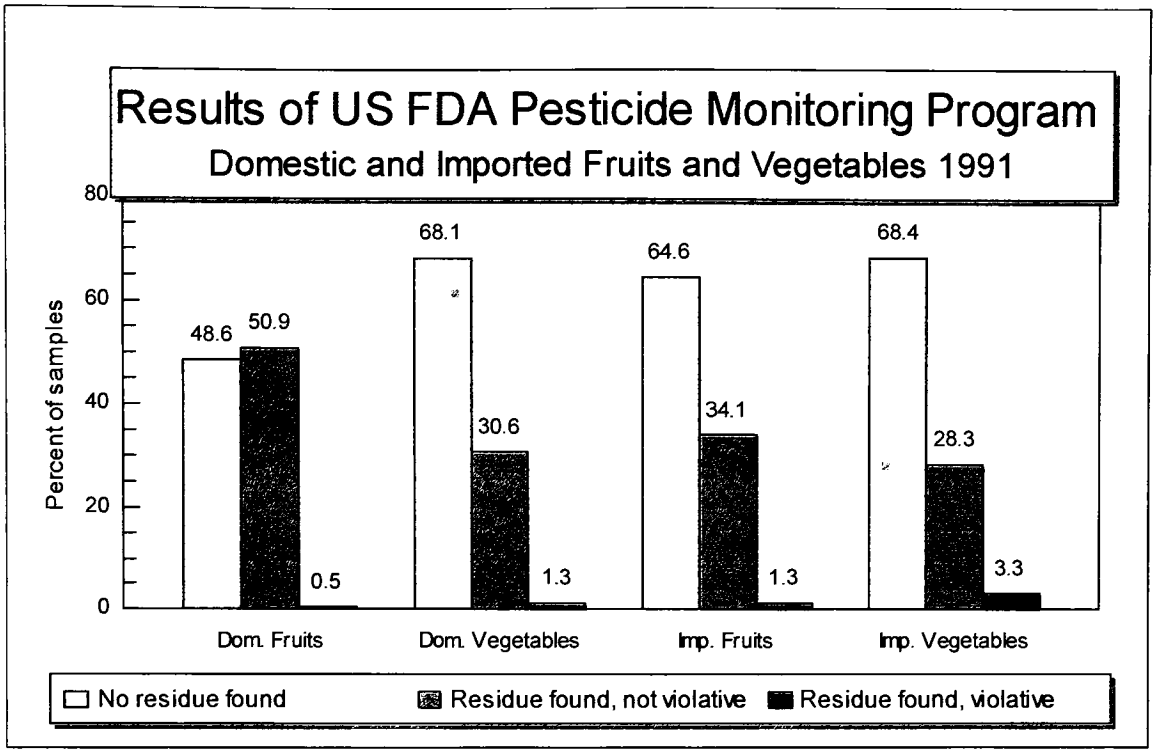
Figure 6. **US FDA Pesticide Residue Monitoring Program, 1989 and 1990**

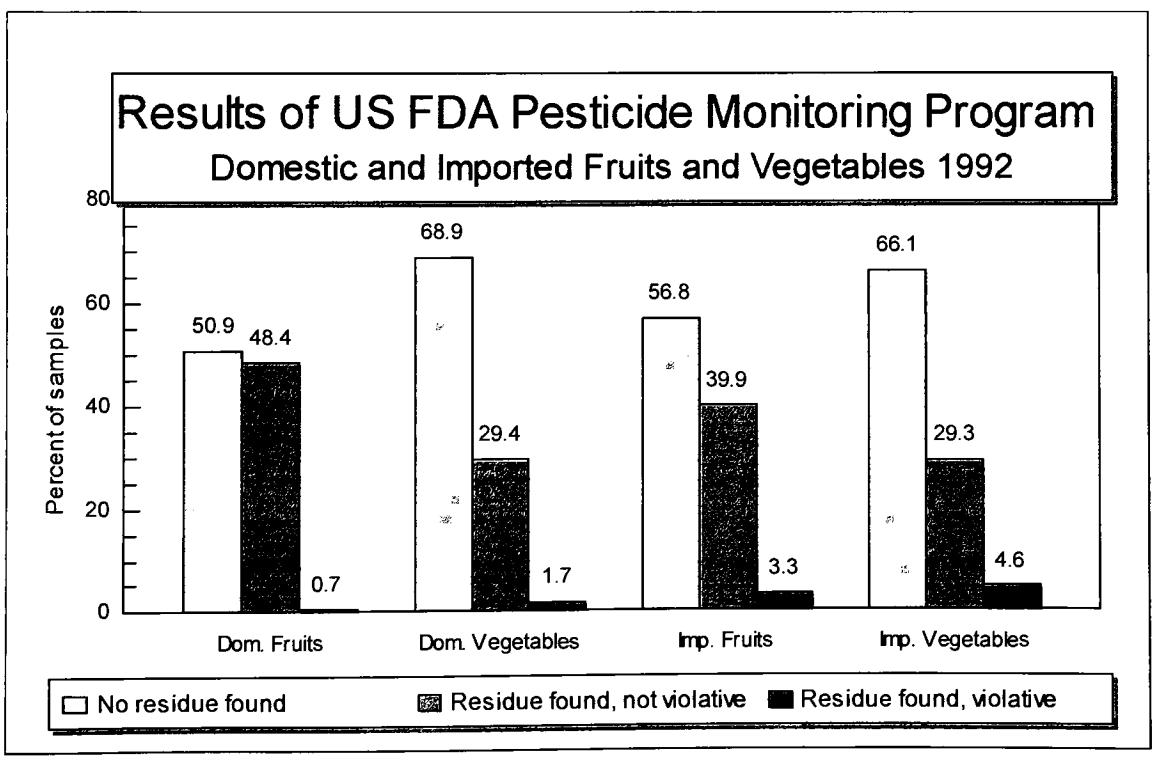




US Food and Drug Administration

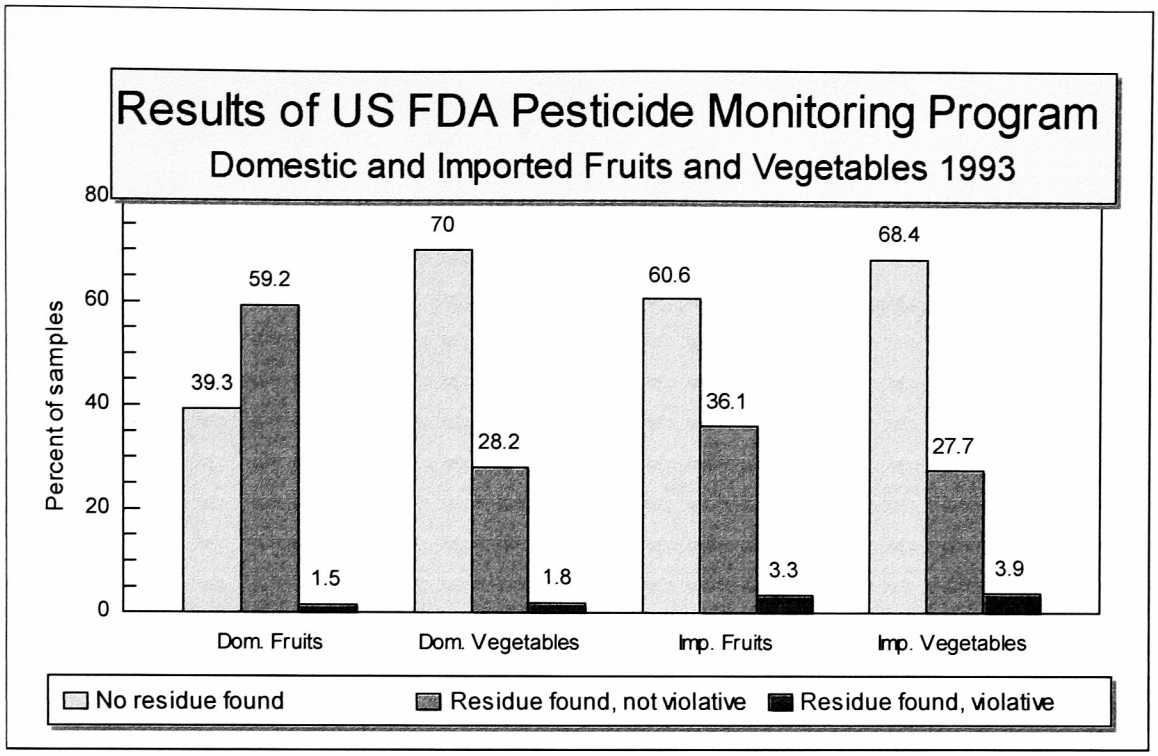
Figure 7. **US FDA Pesticide Residue Monitoring Program, 1991 and 1992**

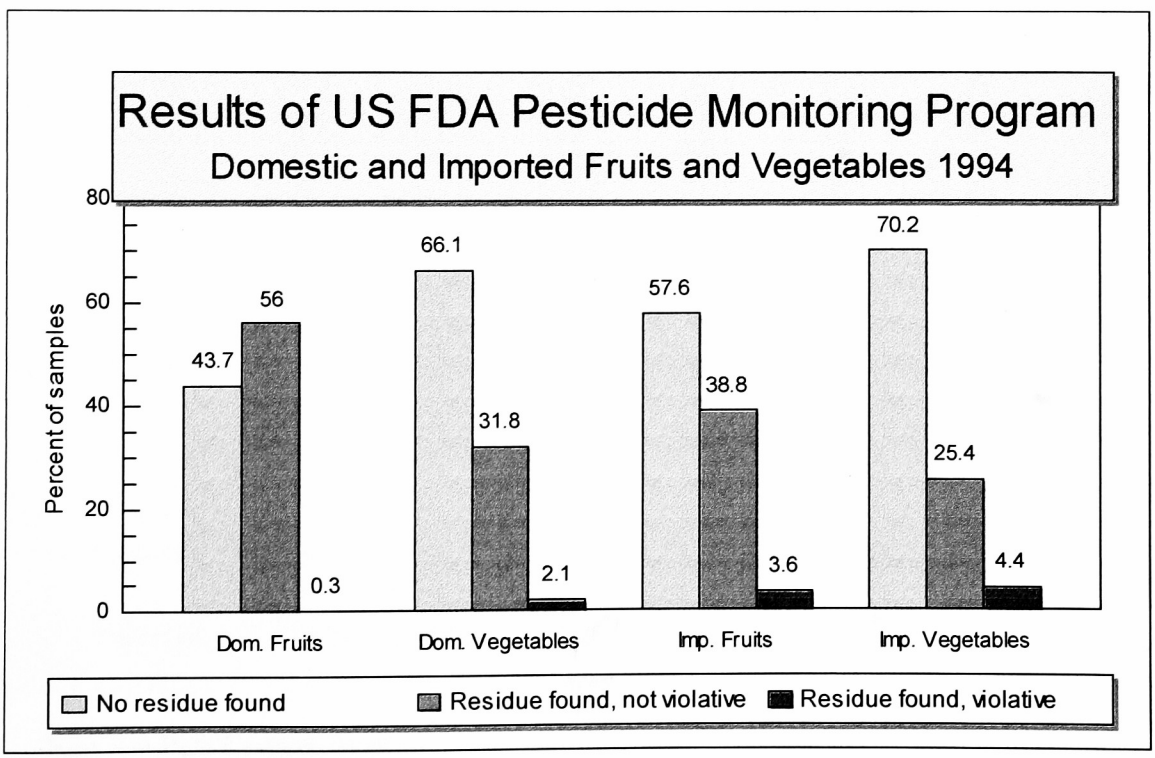




US Food and Drug Administration

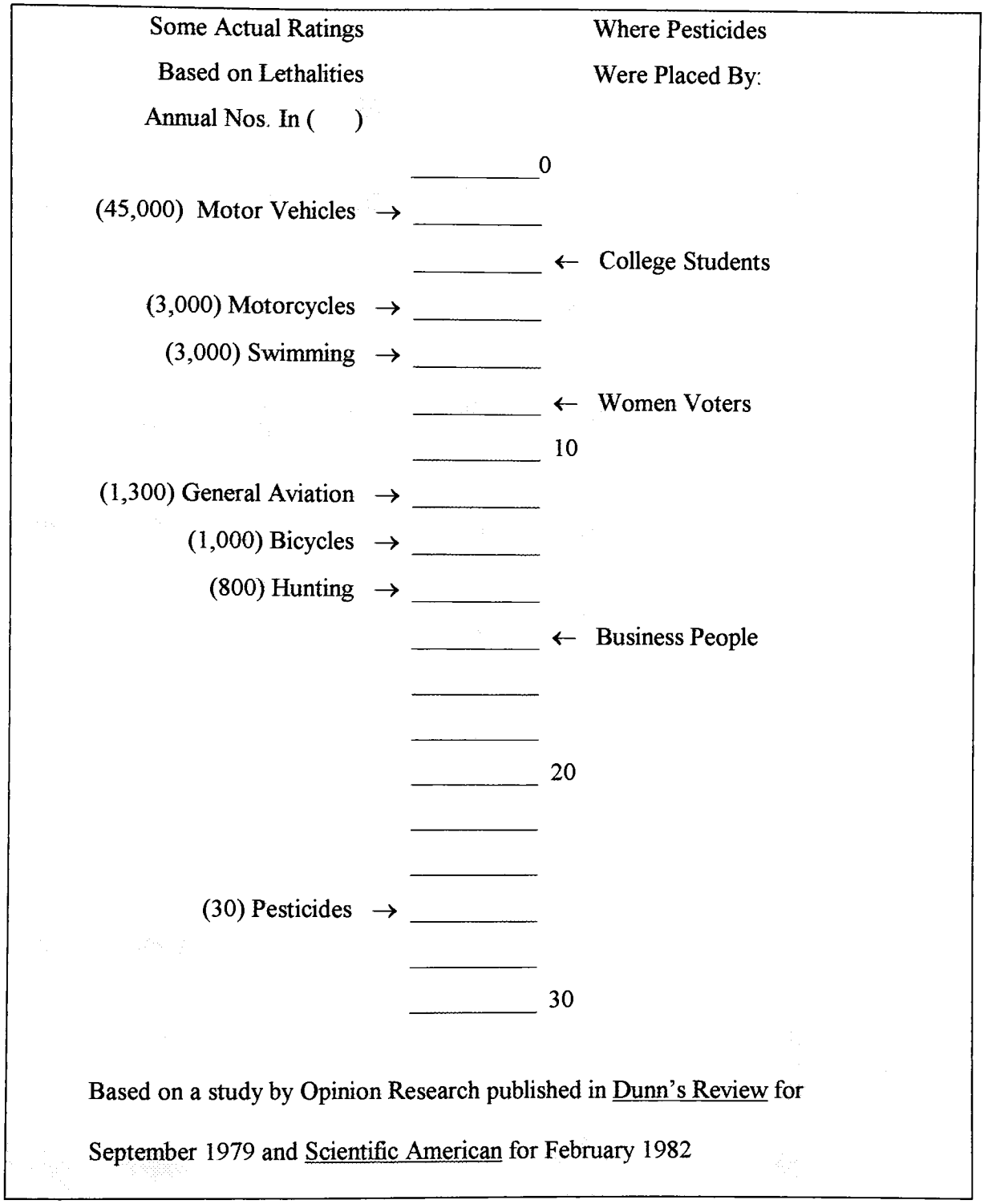
Figure 8. **US FDA Pesticide Residue Monitoring Program, 1993 and 1994**





US Food and Drug Administration

Figure 9. **Ratings of Pesticide Risks Compared to Actual Numbers for 1982**



National Pest Control Association

Figure 10. **Percentage of Consumers With a Great Deal or Some Concern with Pesticide Use, 1965 and 1984**

	1965	1984
How much have you personally been concerned or worried about the possible dangers of farmers using pesticides?	31.6	76.0
How much danger from pesticides do you feel there is for the farmer who handles and applies them?	15.0	78.7
How much danger do you feel chemical sprays and dusts have for wildlife that may come into direct or indirect contact with them?	51.8	80.8
How much danger do you feel there is to the person who eats fruits and vegetables that have been sprayed or dusted with pesticides?	41.5	71.1

Sachs, Blair, and Richter, 1987

Figure 11. **Percentage of Sample Responding Positively**

	1965	1984
Use chemical sprays in the garden	72.9	35.0
Pesticides affect cows milk	30.8	69.9
Pesticides affect chicken meat	24.7	67.1
Farmers are careful with pesticides	81.5	61.6
Government adequately regulates chemical use in or on food	97.7	45.8
Foods purchased from retail stores are adequately inspected	94.0	48.9

Sachs, Blair, and Richter, 1987

Figure 12. **Percent of Respondents Willing to Buy Cosmetically Imperfect Oranges Prior to and Following Information About Reduced Pesticide Use (n=229)**

	Level 1 Damage		Level 2 Damage	
Willingness to Buy	Before	After	Before	After
Much Less	43	10	62	17
Less	35	15	25	17
Same	16	12	9	9
More	3	27	2	28
Much More	3	36	3	30

Bunn, Feenstra, Lynch, and Sommer, 1990

Figure 13. **Pesticide Use on Produce Carries Benefits and Costs**

+ Potential benefits of pesticide use

•Decrease food costs •Enhance cosmetic appearance •Expand variety of foods marketed in any one location •Extend storage, transportation, and shelf-life •Help assure consistent year-round supply •Help meet the world's food supply needs •Improve food quality by preserving nutritional integrity •Reduce naturally occurring toxins •Stabilize and enhance crop yields

– Potential costs of pesticide use

•Cause harm to wildlife •Contaminate surface and groundwater •Decrease food safety •Decrease worker safety •Increase resistance of insects, fungi, and bacteria to pesticides •Weaken consumer confidence in the food supply

– Potential costs of banning pesticides with limited substitutes

•Accelerate increased resistance of insects, fungi, and bacteria to limited pesticides still available for use •Add to total quantities of pesticides used •Affect cosmetic appearance •Limit distance shipped to market •Raise costs for users of the banned pesticide(s) •Reduce income for producers in certain regions •Reduce yields and storability, thereby increasing food costs

+ Potential benefits of banning pesticides with limited substitutes

•Generate regional advantage by encouraging more production where there are fewer pest problems •Improve worker safety •Nonusers may benefit from increased produce prices without facing higher costs •Reduce food safety risks from pesticide residues •Reduce risks to wildlife •Reduce surface and groundwater contamination

Buzby and Skees, 1994

Appendix C

Appendix C contains the crosstabs produced with the crosstab function of SPSS for Windows and used to analyze the relationship between various dependent and independent variables.

VAR02 AVOID BUYING FROM SOME COUNTRIES
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

VAR02	Count / Row Pct / Col Pct / Tot Pct	VAR07 VERY CONCERNED 1.00	SOMEWHAT CONCERNED 2.00	NOT CONCERNED 3.00	Row Total
1.00 YES		71	48	5	124
		57.3	38.7	4.0	41.3
		65.7	27.3	31.3	
		23.7	16.0	1.7	
2.00 NO		37	128	11	176
		21.0	72.7	6.3	58.7
		34.3	72.7	68.8	
		12.3	42.7	3.7	
Column Total		108	176	16	300
		36.0	58.7	5.3	100.0

Number of Missing Observations: 2

VAR03 MORE LIKELY TO BUY GROWN IN NEW YORK
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

VAR03	Count / Row Pct / Col Pct / Tot Pct	VAR07 VERY CONCERNED 1.00	SOMEWHAT CONCERNED 2.00	NOT CONCERNED 3.00	Row Total
1.00 YES		87	116	8	211
		41.2	55.0	3.8	70.3
		79.8	66.3	50.0	
		29.0	38.7	2.7	
2.00 NO		22	59	8	89
		24.7	66.3	9.0	29.7
		20.2	33.7	50.0	
		7.3	19.7	2.7	
Column Total		109	175	16	300
		36.3	58.3	5.3	100.0

Number of Missing Observations: 2

VAR05 EVER USED CHEM. PESTICIDES IN HOME
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

		VAR07			
	Count Row Pct Col Pct Tot Pct	VERY CON CERNED 1.00	SOMEWHAT CONCERN 2.00	NOT CONC ERNED 3.00	Row Total
VAR05					
	1.00	54	116	11	181
YES		29.8	64.1	6.1	60.7
		50.0	66.7	68.8	
		18.1	38.9	3.7	
	2.00	54	58	5	117
NO		46.2	49.6	4.3	39.3
		50.0	33.3	31.3	
		18.1	19.5	1.7	
	Column Total	108 36.2	174 58.4	16 5.4	298 100.0

Number of Missing Observations: 4

VAR14 HEARD OF INTEGRATED PEST MANAGEMENT(IPM)
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

		VAR07			
	Count Row Pct Col Pct Tot Pct	VERY CON CERNED 1.00	SOMEWHAT CONCERN 2.00	NOT CONC ERNED 3.00	Row Total
VAR14					
	1.00	24	30	3	57
YES		42.1	52.6	5.3	19.0
		22.2	17.0	18.8	
		8.0	10.0	1.0	
	2.00	84	146	13	243
NO		34.6	60.1	5.3	81.0
		77.8	83.0	81.3	
		28.0	48.7	4.3	
	Column Total	108 36.0	176 58.7	16 5.3	300 100.0

Number of Missing Observations: 2

VAR10 ACCEPT BLEMISHES FOR PESTICIDE-FREE
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

		VAR07			
	Count Row Pct Col Pct Tot Pct	VERY CON CERNED 1.00	SOMEWHAT CONC ERNED 2.00	NOT CONC ERNED 3.00	Row Total
VAR10					
	1.00	76	101	5	182
YES		41.8	55.5	2.7	61.1
		69.7	58.4	31.3	
		25.5	33.9	1.7	
	2.00	33	72	11	116
NO		28.4	62.1	9.5	38.9
		30.3	41.6	68.8	
		11.1	24.2	3.7	
	Column Total	109 36.6	173 58.1	16 5.4	298 100.0

Number of Missing Observations: 4

VAR16 ACCEPT BLEMISHES FOR IPM GROWN
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

		VAR07			
	Count Row Pct Col Pct Tot Pct	VERY CON CERNED 1.00	SOMEWHAT CONC ERNED 2.00	NOT CONC ERNED 3.00	Row Total
VAR16					
	1.00	73	102	4	179
YES		40.8	57.0	2.2	60.7
		68.2	59.3	25.0	
		24.7	34.6	1.4	
	2.00	34	70	12	116
NO		29.3	60.3	10.3	39.3
		31.8	40.7	75.0	
		11.5	23.7	4.1	
	Column Total	107 36.3	172 58.3	16 5.4	295 100.0

Number of Missing Observations: 7

VAR11 WILLING TO PAY MORE FOR PESTICIDE-FREE
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

		VAR07			
	Count Row Pct Col Pct Tot Pct	VERY CON CERNED 1.00	SOMEWHAT CONCERN 2.00	NOT CONC ERNED 3.00	Row Total
VAR11					
	1.00	92	120	4	216
YES		42.6	55.6	1.9	72.0
		85.2	68.2	25.0	
		30.7	40.0	1.3	
	2.00	16	56	12	84
NO		19.0	66.7	14.3	28.0
		14.8	31.8	75.0	
		5.3	18.7	4.0	
	Column Total	108 36.0	176 58.7	16 5.3	300 100.0

Number of Missing Observations: 2

VAR17 WILLING TO PAY MORE FOR IPM GROWN
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

		VAR07			
	Count Row Pct Col Pct Tot Pct	VERY CON CERNED 1.00	SOMEWHAT CONCERN 2.00	NOT CONC ERNED 3.00	Row Total
VAR17					
	1.00	85	120	7	212
YES		40.1	56.6	3.3	72.4
		83.3	68.6	43.8	
		29.0	41.0	2.4	
	2.00	17	55	9	81
NO		21.0	67.9	11.1	27.6
		16.7	31.4	56.3	
		5.8	18.8	3.1	
	Column Total	102 34.8	175 59.7	16 5.5	293 100.0

Number of Missing Observations: 9

VAR12 HOW MUCH MORE FOR PESTICIDE-FREE
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

		VAR07			
	Count / Row Pct / Col Pct / Tot Pct	VERY CONCERNED 1.00	SOMEWHAT CONCERN 2.00	NOT CONCERNED 3.00	Row Total
VAR12					
1 TO 9%	1.00	67 38.5 71.3 28.3	102 58.6 75.0 43.0	5 2.9 71.4 2.1	174 73.4
10 TO 24%	2.00	21 38.2 22.3 8.9	32 58.2 23.5 13.5	2 3.6 28.6 .8	55 23.2
25% OR MORE	3.00	6 75.0 6.4 2.5	2 25.0 1.5 .8		8 3.4
	Column Total	94 39.7	136 57.4	7 3.0	237 100.0

Number of Missing Observations: 65

VAR18 HOW MUCH MORE FOR IPM GROWN
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

		VAR07			
	Count / Row Pct / Col Pct / Tot Pct	VERY CONCERNED 1.00	SOMEWHAT CONCERN 2.00	NOT CONCERNED 3.00	Row Total
VAR18					
1 TO 9%	1.00	67 37.6 73.6 28.4	105 59.0 77.2 44.5	6 3.4 66.7 2.5	178 75.4
10 TO 24%	2.00	20 38.5 22.0 8.5	29 55.8 21.3 12.3	3 5.8 33.3 1.3	52 22.0
25% OR MORE	3.00	4 66.7 4.4 1.7	2 33.3 1.5 .8		6 2.5
	Column Total	91 38.6	136 57.6	9 3.8	236 100.0

Number of Missing Observations: 66

VAR15 MORE LIKELY TO BUY IPM FRUITS/VEG
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

VAR15	Count / Row Pct / Col Pct / Tot Pct	VAR07 VERY CONCERNED 1.00	SOMEWHAT CONCERNED 2.00	NOT CONCERNED 3.00	Row Total
YES	1.00	102	153	8	263
		38.8	58.2	3.0	88.9
		96.2	87.9	50.0	
		34.5	51.7	2.7	
NO	2.00	4	21	8	33
		12.1	63.6	24.2	11.1
		3.8	12.1	50.0	
		1.4	7.1	2.7	
	Column Total	106	174	16	296
		35.8	58.8	5.4	100.0

Number of Missing Observations: 6

VAR22 PRODUCE PURCHASE CATEGORY
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

VAR22	Count / Row Pct / Col Pct / Tot Pct	VAR07 VERY CONCERNED 1.00	SOMEWHAT CONCERNED 2.00	NOT CONCERNED 3.00	Row Total
HEAVY	1.00	45	55	5	105
		42.9	52.4	4.8	34.9
		41.3	31.3	31.3	
		15.0	18.3	1.7	
MEDIUM	2.00	36	60	4	100
		36.0	60.0	4.0	33.2
		33.0	34.1	25.0	
		12.0	19.9	1.3	
LIGHT	3.00	28	61	7	96
		29.2	63.5	7.3	31.9
		25.7	34.7	43.8	
		9.3	20.3	2.3	
	Column Total	109	176	16	301
		36.2	58.5	5.3	100.0

Number of Missing Observations: 1

VAR24 ETHNIC IDENTIFICATION
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

VAR24	Count / Row Pct / Col Pct / Tot Pct	VAR07 VERY CONCERNED 1.00	SOMEWHAT CONCERN 2.00	NOT CONCERNED 3.00	Row Total
WHITE	1.00	84	157	15	256
		32.8	61.3	5.9	86.8
		80.0	90.2	93.8	
		28.5	53.2	5.1	
BLACK	3.00	7	6		13
		53.8	46.2		4.4
		6.7	3.4		
		2.4	2.0		
HISPANIC	4.00	3	2		5
		60.0	40.0		1.7
		2.9	1.1		
		1.0	.7		
ASIAN	5.00	9	9	1	19
		47.4	47.4	5.3	6.4
		8.6	5.2	6.3	
		3.1	3.1	.3	
OTHER	6.00	2			2
		100.0			.7
		1.9			
		.7			
	Column Total	105	174	16	295
		35.6	59.0	5.4	100.0

Number of Missing Observations: 7

VAR25A WHERE DID YOU GROW UP
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

VAR25A	Count / Row Pct / Col Pct / Tot Pct	VAR07 VERY CONCERNED 1.00	SOMEWHAT CONCERNED 2.00	NOT CONCERNED 3.00	Row Total
1.00 CITY		37	55	1	93
		39.8	59.1	1.1	31.6
		34.6	32.2	6.3	
		12.6	18.7	.3	
2.00 SUBURB		43	73	7	123
		35.0	59.3	5.7	41.8
		40.2	42.7	43.8	
		14.6	24.8	2.4	
3.00 RURAL		27	43	8	78
		34.6	55.1	10.3	26.5
		25.2	25.1	50.0	
		9.2	14.6	2.7	
Column Total		107	171	16	294
		36.4	58.2	5.4	100.0

Number of Missing Observations: 8

VAR25B WHERE DO YOU LIVE NOW
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

VAR25B	Count / Row Pct / Col Pct / Tot Pct	VAR07 VERY CONCERNED 1.00	SOMEWHAT CONCERNED 2.00	NOT CONCERNED 3.00	Row Total
1.00 CITY		16	39	4	59
		27.1	66.1	6.8	20.1
		15.1	22.7	25.0	
		5.4	13.3	1.4	
2.00 SUBURB		68	111	8	187
		36.4	59.4	4.3	63.6
		64.2	64.5	50.0	
		23.1	37.8	2.7	
3.00 RURAL		22	22	4	48
		45.8	45.8	8.3	16.3
		20.8	12.8	25.0	
		7.5	7.5	1.4	
Column Total		106	172	16	294
		36.1	58.5	5.4	100.0

Number of Missing Observations: 8

VAR07 CONCERN ABOUT CHEMICAL PESTICIDES IN FOOD
by HOUSEHOLDS WITH RESIDENTS OF DIFFERENT AGES

Count
Col Pct

AGES	< 5	5-12	13-19	20-29	30-39	40-49	50-59	> 60
VERY CONCERNED	23 39.0	19 29.7	11 24.4	21 27.6	40 37.4	31 33.3	20 39.2	22 39.3
SOMEWHAT CONCERNED	35 59.3	43 67.2	31 68.9	49 64.5	63 58.9	58 62.5	28 54.9	29 51.8
NOT CONCERNED	1 1.7	2 3.1	3 6.7	6 7.9	4 3.7	4 4.3	3 5.9	5 8.9

VAR02 AVOID BUYING FROM SOME COUNTRIES
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR02	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HA ZARD 3.00	NOT A HE ALTH HAZ 4.00	NOT LIKE LY PRESE 5.00	Row Total
YES	1.00	42	47	17	16	2	124
		33.9	37.9	13.7	12.9	1.6	41.3
		64.6	40.9	27.9	28.6	66.7	
		14.0	15.7	5.7	5.3	.7	
NO	2.00	23	68	44	40	1	176
		13.1	38.6	25.0	22.7	.6	58.7
		35.4	59.1	72.1	71.4	33.3	
		7.7	22.7	14.7	13.3	.3	
	Column Total	65	115	61	56	3	300
		21.7	38.3	20.3	18.7	1.0	100.0

Number of Missing Observations: 2

VAR03 MORE LIKELY TO BUY GROWN IN NEW YORK
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR03	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HA ZARD 3.00	NOT A HE ALTH HAZ 4.00	NOT LIKE LY PRESE 5.00	Row Total
YES	1.00	50	83	43	34	1	211
		23.7	39.3	20.4	16.1	.5	70.3
		75.8	72.2	70.5	61.8	33.3	
		16.7	27.7	14.3	11.3	.3	
NO	2.00	16	32	18	21	2	89
		18.0	36.0	20.2	23.6	2.2	29.7
		24.2	27.8	29.5	38.2	66.7	
		5.3	10.7	6.0	7.0	.7	
	Column Total	66	115	61	55	3	300
		22.0	38.3	20.3	18.3	1.0	100.0

Number of Missing Observations: 2

VAR05 EVER USED CHEM. PESTICIDES IN HOME
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR05	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HA ZARD 3.00	NOT A HE ALTH HAZ 4.00	NOT LIKE LY PRESE 5.00	Row Total
YES	1.00	27	70	41	42	1	181
		14.9	38.7	22.7	23.2	.6	60.7
		41.5	61.4	68.3	75.0	33.3	
		9.1	23.5	13.8	14.1	.3	
NO	2.00	38	44	19	14	2	117
		32.5	37.6	16.2	12.0	1.7	39.3
		58.5	38.6	31.7	25.0	66.7	
		12.8	14.8	6.4	4.7	.7	
	Column Total	65	114	60	56	3	298
		21.8	38.3	20.1	18.8	1.0	100.0

Number of Missing Observations: 4

VAR14 HEARD OF INTEGRATED PEST MANAGEMENT(IPM)
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR14	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HA ZARD 3.00	NOT A HE ALTH HAZ 4.00	NOT LIKE LY PRESE 5.00	Row Total
YES	1.00	11	21	11	14		57
		19.3	36.8	19.3	24.6		19.0
		16.7	18.4	18.0	25.0		
		3.7	7.0	3.7	4.7		
NO	2.00	55	93	50	42	3	243
		22.6	38.3	20.6	17.3	1.2	81.0
		83.3	81.6	82.0	75.0	100.0	
		18.3	31.0	16.7	14.0	1.0	
	Column Total	66	114	61	56	3	300
		22.0	38.0	20.3	18.7	1.0	100.0

Number of Missing Observations: 2

VAR10 ACCEPT BLEMISHES FOR PESTICIDE-FREE
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR10	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HA ZARD 3.00	NOT A HE ALTH HAZ 4.00	NOT LIKE LY PRESE 5.00	Row Total
1.00 YES		47	78	31	24	2	182
		25.8	42.9	17.0	13.2	1.1	61.1
		71.2	68.4	52.5	42.9	66.7	
		15.8	26.2	10.4	8.1	.7	
2.00 NO		19	36	28	32	1	116
		16.4	31.0	24.1	27.6	.9	38.9
		28.8	31.6	47.5	57.1	33.3	
		6.4	12.1	9.4	10.7	.3	
Column Total		66	114	59	56	3	298
		22.1	38.3	19.8	18.8	1.0	100.0

Number of Missing Observations: 4

VAR16 ACCEPT BLEMISHES FOR IPM GROWN
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR16	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HA ZARD 3.00	NOT A HE ALTH HAZ 4.00	NOT LIKE LY PRESE 5.00	Row Total
1.00 YES		44	73	37	23	2	179
		24.6	40.8	20.7	12.8	1.1	60.7
		67.7	65.2	62.7	41.1	66.7	
		14.9	24.7	12.5	7.8	.7	
2.00 NO		21	39	22	33	1	116
		18.1	33.6	19.0	28.4	.9	39.3
		32.3	34.8	37.3	58.9	33.3	
		7.1	13.2	7.5	11.2	.3	
Column Total		65	112	59	56	3	295
		22.0	38.0	20.0	19.0	1.0	100.0

Number of Missing Observations: 7

VAR11 WILLING TO PAY MORE FOR PESTICIDE-FREE
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR11	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HAZARD 3.00	NOT A HEALTH HAZ 4.00	NOT LIKELY PRESE 5.00	Row Total
YES	1.00	55	95	40	23	3	216
		25.5	44.0	18.5	10.6	1.4	72.0
		83.3	82.6	65.6	41.8	100.0	
		18.3	31.7	13.3	7.7	1.0	
NO	2.00	11	20	21	32		84
		13.1	23.8	25.0	38.1		28.0
		16.7	17.4	34.4	58.2		
		3.7	6.7	7.0	10.7		
	Column Total	66	115	61	55	3	300
		22.0	38.3	20.3	18.3	1.0	100.0

Number of Missing Observations: 2

VAR17 WILLING TO PAY MORE FOR IPM GROWN
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR17	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HAZARD 3.00	NOT A HEALTH HAZ 4.00	NOT LIKELY PRESE 5.00	Row Total
YES	1.00	47	94	43	25	3	212
		22.2	44.3	20.3	11.8	1.4	72.4
		74.6	83.2	71.7	46.3	100.0	
		16.0	32.1	14.7	8.5	1.0	
NO	2.00	16	19	17	29		81
		19.8	23.5	21.0	35.8		27.6
		25.4	16.8	28.3	53.7		
		5.5	6.5	5.8	9.9		
	Column Total	63	113	60	54	3	293
		21.5	38.6	20.5	18.4	1.0	100.0

Number of Missing Observations: 9

VAR12 HOW MUCH MORE FOR PESTICIDE-FREE
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR12	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HAZARD 3.00	NOT A HEALTH HAZ 4.00	NOT LIKELY PRESE 5.00	Row Total
1 TO 9%	1.00	39	65	42	26	2	174
		22.4	37.4	24.1	14.9	1.1	73.4
		68.4	65.0	91.3	83.9	66.7	
		16.5	27.4	17.7	11.0	.8	
10 TO 24%	2.00	13	32	4	5	1	55
		23.6	58.2	7.3	9.1	1.8	23.2
		22.8	32.0	8.7	16.1	33.3	
		5.5	13.5	1.7	2.1	.4	
25% OR MORE	3.00	5	3				8
		62.5	37.5				3.4
		8.8	3.0				
		2.1	1.3				
	Column Total	57	100	46	31	3	237
		24.1	42.2	19.4	13.1	1.3	100.0

Number of Missing Observations: 65

VAR18 HOW MUCH MORE FOR IPM GROWN
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR18	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HAZARD 3.00	NOT A HEALTH HAZ 4.00	NOT LIKELY PRESE 5.00	Row Total
1 TO 9%	1.00	40	68	44	24	2	178
		22.5	38.2	24.7	13.5	1.1	75.4
		75.5	68.0	91.7	75.0	66.7	
		16.9	28.8	18.6	10.2	.8	
10 TO 24%	2.00	9	30	4	8	1	52
		17.3	57.7	7.7	15.4	1.9	22.0
		17.0	30.0	8.3	25.0	33.3	
		3.8	12.7	1.7	3.4	.4	
25% OR MORE	3.00	4	2				6
		66.7	33.3				2.5
		7.5	2.0				
		1.7	.8				
	Column Total	53	100	48	32	3	236
		22.5	42.4	20.3	13.6	1.3	100.0

Number of Missing Observations: 66

VAR15 MORE LIKELY TO BUY IPM FRUITS/VEG
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR15	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HAZARD 3.00	NOT A HEALTH HAZ 4.00	NOT LIKELY PRESE 5.00	Row Total
YES	1.00	57	110	53	41	3	264
		21.6	41.7	20.1	15.5	1.1	89.2
		89.1	97.3	86.9	74.5	100.0	
		19.3	37.2	17.9	13.9	1.0	
NO	2.00	7	3	8	14		32
		21.9	9.4	25.0	43.8		10.8
		10.9	2.7	13.1	25.5		
		2.4	1.0	2.7	4.7		
	Column Total	64	113	61	55	3	296
		21.6	38.2	20.6	18.6	1.0	100.0

Number of Missing Observations: 6

VAR22 PRODUCE PURCHASE CATEGORY
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR22	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HAZARD 3.00	NOT A HEALTH HAZ 4.00	NOT LIKELY PRESE 5.00	Row Total
HEAVY	1.00	28	34	23	20	1	106
		26.4	32.1	21.7	18.9	.9	35.2
		42.4	29.6	37.7	35.7	33.3	
		9.3	11.3	7.6	6.6	.3	
MEDIUM	2.00	22	37	21	17	2	99
		22.2	37.4	21.2	17.2	2.0	32.9
		33.3	32.2	34.4	30.4	66.7	
		7.3	12.3	7.0	5.6	.7	
LIGHT	3.00	16	44	17	19		96
		16.7	45.8	17.7	19.8		31.9
		24.2	38.3	27.9	33.9		
		5.3	14.6	5.6	6.3		
	Column Total	66	115	61	56	3	301
		21.9	38.2	20.3	18.6	1.0	100.0

Number of Missing Observations: 1

VAR24 ETHNIC IDENTIFICATION
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR24	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HA ZARD 3.00	NOT A HE ALTH HAZ 4.00	NOT LIKE LY PRESE 5.00	Row Total
WHITE	1.00	49	100	57	49	1	256
		19.1	39.1	22.3	19.1	.4	86.8
		77.8	88.5	93.4	89.1	33.3	
		16.6	33.9	19.3	16.6	.3	
BLACK	3.00	5	5	2	1		13
		38.5	38.5	15.4	7.7		4.4
		7.9	4.4	3.3	1.8		
		1.7	1.7	.7	.3		
HISPANIC	4.00	2	1		2		5
		40.0	20.0		40.0		1.7
		3.2	.9		3.6		
		.7	.3		.7		
ASIAN	5.00	6	6	2	3	2	19
		31.6	31.6	10.5	15.8	10.5	6.4
		9.5	5.3	3.3	5.5	66.7	
		2.0	2.0	.7	1.0	.7	
OTHER	6.00	1	1				2
		50.0	50.0				.7
		1.6	.9				
		.3	.3				
	Column Total	63	113	61	55	3	295
		21.4	38.3	20.7	18.6	1.0	100.0

Number of Missing Observations: 7

VAR25A WHERE DID YOU GROW UP
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR25A	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HAZARD 3.00	NOT A HEALTH HAZ 4.00	NOT LIKELY PRESE 5.00	Row Total
1.00 CITY		30	30	18	14		92
		32.6	32.6	19.6	15.2		31.3
		46.2	27.3	29.5	25.5		
		10.2	10.2	6.1	4.8		
2.00 SUBURB		20	47	24	29	3	123
		16.3	38.2	19.5	23.6	2.4	41.8
		30.8	42.7	39.3	52.7	100.0	
		6.8	16.0	8.2	9.9	1.0	
3.00 RURAL		15	33	19	12		79
		19.0	41.8	24.1	15.2		26.9
		23.1	30.0	31.1	21.8		
		5.1	11.2	6.5	4.1		
Column Total		65	110	61	55	3	294
		22.1	37.4	20.7	18.7	1.0	100.0

Number of Missing Observations: 8

VAR25B WHERE DO YOU LIVE NOW
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR25B	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HAZARD 3.00	NOT A HEALTH HAZ 4.00	NOT LIKELY PRESE 5.00	Row Total
1.00 CITY		12	22	14	11		59
		20.3	37.3	23.7	18.6		20.1
		18.2	20.2	23.0	20.0		
		4.1	7.5	4.8	3.7		
2.00 SUBURB		43	70	38	34	2	187
		23.0	37.4	20.3	18.2	1.1	63.6
		65.2	64.2	62.3	61.8	66.7	
		14.6	23.8	12.9	11.6	.7	
3.00 RURAL		11	17	9	10	1	48
		22.9	35.4	18.8	20.8	2.1	16.3
		16.7	15.6	14.8	18.2	33.3	
		3.7	5.8	3.1	3.4	.3	
Column Total		66	109	61	55	3	294
		22.4	37.1	20.7	18.7	1.0	100.0

Number of Missing Observations: 8

VAR08 PEST. RESIDUES IN FOOD AS A HEALTH HAZARD
by HOUSEHOLDS WITH RESIDENTS OF DIFFERENT AGES

Count
Col Pct

AGES	< 5	5-12	13-19	20-29	30-39	40-49	50-59	> 60
SERIOUS	12	12	10	14	27	13	12	11
HAZARD	20.7	18.8	21.7	18.7	25.5	13.8	23.1	19.6
MODERATE	27	20	13	37	36	37	14	22
HAZARD3	46.6	31.3	28.3	49.3	34.0	39.4	26.9	39.3
SMALL	11	17	14	9	23	25	15	10
HAZARD	19.0	26.6	30.4	12.0	21.7	26.6	28.8	17.9
NOT A HEALTH	8	15	9	13	19	18	9	13
HAZARD	13.8	23.4	19.6	17.4	17.9	19.1	17.3	23.2
NOT LIKELY				2	1	1	2	
PRESENT				2.7	.9	1.1	3.8	

VAR02 AVOID BUYING FROM SOME COUNTRIES
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR02	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CO NTAM 3.00	SMALL/NO T A PROB 4.00	NOT LIKE LY 5.00	Row Total
YES	1.00	49	47	24	3	1	124
		39.5	37.9	19.4	2.4	.8	41.5
		53.3	42.3	31.6	20.0	20.0	
		16.4	15.7	8.0	1.0	.3	
NO	2.00	43	64	52	12	4	175
		24.6	36.6	29.7	6.9	2.3	58.5
		46.7	57.7	68.4	80.0	80.0	
		14.4	21.4	17.4	4.0	1.3	
	Column Total	92	111	76	15	5	299
		30.8	37.1	25.4	5.0	1.7	100.0

Number of Missing Observations: 3

VAR03 MORE LIKELY TO BUY GROWN IN NEW YORK
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR03	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CO NTAM 3.00	SMALL/NO T A PROB 4.00	NOT LIKE LY 5.00	Row Total
YES	1.00	65	85	50	9	1	210
		31.0	40.5	23.8	4.3	.5	70.5
		70.7	76.6	66.7	60.0	20.0	
		21.8	28.5	16.8	3.0	.3	
NO	2.00	27	26	25	6	4	88
		30.7	29.5	28.4	6.8	4.5	29.5
		29.3	23.4	33.3	40.0	80.0	
		9.1	8.7	8.4	2.0	1.3	
	Column Total	92	111	75	15	5	298
		30.9	37.2	25.2	5.0	1.7	100.0

Number of Missing Observations: 4

VAR05 EVER USED CHEM. PESTICIDES IN HOME
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR05	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CO NTAM 3.00	SMALL/NO T A PROB 4.00	NOT LIKE LY 5.00	Row Total
YES	1.00	42	75	51	9	3	180
		23.3	41.7	28.3	5.0	1.7	60.8
		46.2	68.2	68.0	60.0	60.0	
		14.2	25.3	17.2	3.0	1.0	
NO	2.00	49	35	24	6	2	116
		42.2	30.2	20.7	5.2	1.7	39.2
		53.8	31.8	32.0	40.0	40.0	
		16.6	11.8	8.1	2.0	.7	
	Column Total	91	110	75	15	5	296
		30.7	37.2	25.3	5.1	1.7	100.0

Number of Missing Observations: 6

VAR14 HEARD OF INTEGRATED PEST MANAGEMENT(IPM)
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR14	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CO NTAM 3.00	SMALL/NO T A PROB 4.00	NOT LIKE LY 5.00	Row Total
YES	1.00	21	16	15	2	2	56
		37.5	28.6	26.8	3.6	3.6	18.8
		22.8	14.5	19.7	13.3	40.0	
		7.0	5.4	5.0	.7	.7	
NO	2.00	71	94	61	13	3	242
		29.3	38.8	25.2	5.4	1.2	81.2
		77.2	85.5	80.3	86.7	60.0	
		23.8	31.5	20.5	4.4	1.0	
	Column Total	92	110	76	15	5	298
		30.9	36.9	25.5	5.0	1.7	100.0

Number of Missing Observations: 4

VAR10 ACCEPT BLEMISHES FOR PESTICIDE-FREE
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR10	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CONTAM 3.00	SMALL/NOT A PROB 4.00	NOT LIKELY 5.00	Row Total
YES	1.00	73	65	36	5	3	182
		40.1	35.7	19.8	2.7	1.6	61.5
		79.3	59.6	48.0	33.3	60.0	
		24.7	22.0	12.2	1.7	1.0	
NO	2.00	19	44	39	10	2	114
		16.7	38.6	34.2	8.8	1.8	38.5
		20.7	40.4	52.0	66.7	40.0	
		6.4	14.9	13.2	3.4	.7	
	Column Total	92	109	75	15	5	296
		31.1	36.8	25.3	5.1	1.7	100.0

Number of Missing Observations: 6

VAR16 ACCEPT BLEMISHES FOR IPM GROWN
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR16	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CONTAM 3.00	SMALL/NOT A PROB 4.00	NOT LIKELY 5.00	Row Total
YES	1.00	67	64	42	3	3	179
		37.4	35.8	23.5	1.7	1.7	61.1
		74.4	59.8	55.3	20.0	60.0	
		22.9	21.8	14.3	1.0	1.0	
NO	2.00	23	43	34	12	2	114
		20.2	37.7	29.8	10.5	1.8	38.9
		25.6	40.2	44.7	80.0	40.0	
		7.8	14.7	11.6	4.1	.7	
	Column Total	90	107	76	15	5	293
		30.7	36.5	25.9	5.1	1.7	100.0

Number of Missing Observations: 9

VAR11 WILLING TO PAY MORE FOR PESTICIDE-FREE
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR11	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CO NTAM 3.00	SMALL/NO T A PROB 4.00	NOT LIKE LY 5.00	Row Total
YES	1.00	77	85	47	4	2	215
		35.8	39.5	21.9	1.9	.9	72.1
		83.7	77.3	61.8	26.7	40.0	
		25.8	28.5	15.8	1.3	.7	
NO	2.00	15	25	29	11	3	83
		18.1	30.1	34.9	13.3	3.6	27.9
		16.3	22.7	38.2	73.3	60.0	
		5.0	8.4	9.7	3.7	1.0	
	Column Total	92	110	76	15	5	298
		30.9	36.9	25.5	5.0	1.7	100.0

Number of Missing Observations: 4

VAR17 WILLING TO PAY MORE FOR IPM GROWN
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR17	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CO NTAM 3.00	SMALL/NO T A PROB 4.00	NOT LIKE LY 5.00	Row Total
YES	1.00	71	82	50	6	2	211
		33.6	38.9	23.7	2.8	.9	72.5
		80.7	75.9	66.7	40.0	40.0	
		24.4	28.2	17.2	2.1	.7	
NO	2.00	17	26	25	9	3	80
		21.3	32.5	31.3	11.3	3.8	27.5
		19.3	24.1	33.3	60.0	60.0	
		5.8	8.9	8.6	3.1	1.0	
	Column Total	88	108	75	15	5	291
		30.2	37.1	25.8	5.2	1.7	100.0

Number of Missing Observations: 11

VAR12 HOW MUCH MORE FOR PESTICIDE-FREE
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR12	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CONTAM 3.00	SMALL/NOT A PROB 4.00	NOT LIKELY 5.00	Row Total
1 TO 9%	1.00	47	73	45	6	2	173
		27.2	42.2	26.0	3.5	1.2	73.3
		60.3	76.8	84.9	75.0	100.0	
		19.9	30.9	19.1	2.5	.8	
10 TO 24%	2.00	24	21	8	2		55
		43.6	38.2	14.5	3.6		23.3
		30.8	22.1	15.1	25.0		
		10.2	8.9	3.4	.8		
25% OR MORE	3.00	7	1				8
		87.5	12.5				3.4
		9.0	1.1				
		3.0	.4				
	Column Total	78	95	53	8	2	236
		33.1	40.3	22.5	3.4	.8	100.0

Number of Missing Observations: 66

VAR18 HOW MUCH MORE FOR IPM GROWN
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR18	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CONTAM 3.00	SMALL/NOT A PROB 4.00	NOT LIKELY 5.00	Row Total
1 TO 9%	1.00	52	67	51	5	2	177
		29.4	37.9	28.8	2.8	1.1	75.3
		68.4	73.6	87.9	62.5	100.0	
		22.1	28.5	21.7	2.1	.9	
10 TO 24%	2.00	18	24	7	3		52
		34.6	46.2	13.5	5.8		22.1
		23.7	26.4	12.1	37.5		
		7.7	10.2	3.0	1.3		
25% OR MORE	3.00	6					6
		100.0					2.6
		7.9					
		2.6					
	Column Total	76	91	58	8	2	235
		32.3	38.7	24.7	3.4	.9	100.0

Number of Missing Observations: 67

VAR15 MORE LIKELY TO BUY IPM FRUITS/VEG
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR15	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CONTAM 3.00	SMALL/NO PROB 4.00	NOT LIKELY 5.00	Row Total
1.00 YES		84	101	67	9	3	264
		31.8	38.3	25.4	3.4	1.1	89.5
		93.3	92.7	88.2	60.0	60.0	
		28.5	34.2	22.7	3.1	1.0	
2.00 NO		6	8	9	6	2	31
		19.4	25.8	29.0	19.4	6.5	10.5
		6.7	7.3	11.8	40.0	40.0	
		2.0	2.7	3.1	2.0	.7	
Column Total		90	109	76	15	5	295
		30.5	36.9	25.8	5.1	1.7	100.0

Number of Missing Observations: 7

VAR22 PRODUCE PURCHASE CATEGORY
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR22	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CONTAM 3.00	SMALL/NO PROB 4.00	NOT LIKELY 5.00	Row Total
1.00 HEAVY		37	37	25	4	3	106
		34.9	34.9	23.6	3.8	2.8	35.5
		40.2	33.3	32.9	26.7	60.0	
		12.4	12.4	8.4	1.3	1.0	
2.00 MEDIUM		29	39	26	5		99
		29.3	39.4	26.3	5.1		33.1
		31.5	35.1	34.2	33.3		
		9.7	13.0	8.7	1.7		
3.00 LIGHT		26	35	25	6	2	94
		27.7	37.2	26.6	6.4	2.1	31.4
		28.3	31.5	32.9	40.0	40.0	
		8.7	11.7	8.4	2.0	.7	
Column Total		92	111	76	15	5	299
		30.8	37.1	25.4	5.0	1.7	100.0

Number of Missing Observations: 3

VAR24 ETHNIC IDENTIFICATION
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR24	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CONTAM 3.00	SMALL/NOT A PROB 4.00	NOT LIKELY 5.00	Row Total
WHITE	1.00	74	98	65	14	4	255
		29.0	38.4	25.5	5.5	1.6	86.7
		83.1	89.9	85.5	93.3	80.0	
		25.2	33.3	22.1	4.8	1.4	
BLACK	3.00	5	5	3			13
		38.5	38.5	23.1			4.4
		5.6	4.6	3.9			
		1.7	1.7	1.0			
HISPANIC	4.00	2	2	1			5
		40.0	40.0	20.0			1.7
		2.2	1.8	1.3			
		.7	.7	.3			
ASIAN	5.00	7	3	7	1	1	19
		36.8	15.8	36.8	5.3	5.3	6.5
		7.9	2.8	9.2	6.7	20.0	
		2.4	1.0	2.4	.3	.3	
OTHER	6.00	1	1				2
		50.0	50.0				.7
		1.1	.9				
		.3	.3				
	Column Total	89	109	76	15	5	294
		30.3	37.1	25.9	5.1	1.7	100.0

Number of Missing Observations: 8

VAR25A WHERE DID YOU GROW UP
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR25A	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CO NTAM 3.00	SMALL/NO T A PROB 4.00	NOT LIKE LY 5.00	Row Total
CITY	1.00	27	36	25	3		91
		29.7	39.6	27.5	3.3		31.2
		30.0	33.0	34.2	20.0		
		9.2	12.3	8.6	1.0		
SUBURB	2.00	33	48	30	8	3	122
		27.0	39.3	24.6	6.6	2.5	41.8
		36.7	44.0	41.1	53.3	60.0	
		11.3	16.4	10.3	2.7	1.0	
RURAL	3.00	30	25	18	4	2	79
		38.0	31.6	22.8	5.1	2.5	27.1
		33.3	22.9	24.7	26.7	40.0	
		10.3	8.6	6.2	1.4	.7	
	Column Total	90	109	73	15	5	292
		30.8	37.3	25.0	5.1	1.7	100.0

Number of Missing Observations: 10

VAR25B WHERE DO YOU LIVE NOW
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR25B	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CO NTAM 3.00	SMALL/NO T A PROB 4.00	NOT LIKE LY 5.00	Row Total
CITY	1.00	17	21	16	5		59
		28.8	35.6	27.1	8.5		20.2
		18.7	19.6	21.6	33.3		
		5.8	7.2	5.5	1.7		
SUBURB	2.00	54	72	50	7	2	185
		29.2	38.9	27.0	3.8	1.1	63.4
		59.3	67.3	67.6	46.7	40.0	
		18.5	24.7	17.1	2.4	.7	
RURAL	3.00	20	14	8	3	3	48
		41.7	29.2	16.7	6.3	6.3	16.4
		22.0	13.1	10.8	20.0	60.0	
		6.8	4.8	2.7	1.0	1.0	
	Column Total	91	107	74	15	5	292
		31.2	36.6	25.3	5.1	1.7	100.0

Number of Missing Observations: 10

VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT
by HOUSEHOLDS WITH RESIDENTS OF DIFFERENT AGES

Count
Col Pct

AGES	< 5	5-12	13-19	20-29	30-39	40-49	50-59	> 60
SERIOUS CONTAMINANT	18 31.0	15 23.8	14 31.1	21 28.4	38 35.8	29 31.2	14 27.5	9 16.1
MODERATE CONTAMINANT	25 43.1	27 42.9	23 51.1	33 44.6	37 34.9	38 40.9	17 33.3	23 41.1
SMALL CONTAMINANT	12 20.7	16 25.4	5 11.1	14 18.9	24 22.6	19 20.4	18 35.3	18 32.1
SMALL, NOT A PROBLEM	3 5.2	4 6.3	2 4.4	3 4.1	6 5.7	6 6.5		4 7.1
NOT A LIKELY CONTAMINANT		1 1.6	1 2.2	3 4.1	1 .9	1 1.1	2 3.9	2 3.6

VAR10 ACCEPT BLEMISHES FOR PESTICIDE-FREE
by VAR24 ETHNIC IDENTIFICATION

		VAR24					
	Count / Row Pct / Col Pct / Tot Pct	WHITE	BLACK	HISPANIC	ASIAN	OTHER	Row
VAR10		1.00	3.00	4.00	5.00	6.00	Total
	1.00	154	7	4	14	2	181
YES		85.1	3.9	2.2	7.7	1.1	61.8
		60.6	53.8	80.0	73.7	100.0	
		52.6	2.4	1.4	4.8	.7	
	2.00	100	6	1	5		112
NO		89.3	5.4	.9	4.5		38.2
		39.4	46.2	20.0	26.3		
		34.1	2.0	.3	1.7		
	Column Total	254	13	5	19	2	293
		86.7	4.4	1.7	6.5	.7	100.0

Number of Missing Observations: 9

VAR16 ACCEPT BLEMISHES FOR IPM GROWN
by VAR24 ETHNIC IDENTIFICATION

		VAR24					
	Count / Row Pct / Col Pct / Tot Pct	WHITE	BLACK	HISPANIC	ASIAN	OTHER	Row
VAR16		1.00	3.00	4.00	5.00	6.00	Total
	1.00	153	5	4	15	1	178
YES		86.0	2.8	2.2	8.4	.6	61.0
		60.5	38.5	80.0	78.9	50.0	
		52.4	1.7	1.4	5.1	.3	
	2.00	100	8	1	4	1	114
NO		87.7	7.0	.9	3.5	.9	39.0
		39.5	61.5	20.0	21.1	50.0	
		34.2	2.7	.3	1.4	.3	
	Column Total	253	13	5	19	2	292
		86.6	4.5	1.7	6.5	.7	100.0

Number of Missing Observations: 10

VAR11 WILLING TO PAY MORE FOR PESTICIDE-FREE
by VAR24 ETHNIC IDENTIFICATION

VAR11	Count / Row Pct / Col Pct / Tot Pct	VAR24 WHITE 1.00	BLACK 3.00	HISPANIC 4.00	ASIAN 5.00	OTHER 6.00	Row Total
YES	1.00	180	10	3	17	2	212
		84.9	4.7	1.4	8.0	.9	71.9
		70.3	76.9	60.0	89.5	100.0	
		61.0	3.4	1.0	5.8	.7	
NO	2.00	76	3	2	2		83
		91.6	3.6	2.4	2.4		28.1
		29.7	23.1	40.0	10.5		
		25.8	1.0	.7	.7		
	Column Total	256	13	5	19	2	295
		86.8	4.4	1.7	6.4	.7	100.0

Number of Missing Observations: 7

VAR17 WILLING TO PAY MORE FOR IPM GROWN
by VAR24 ETHNIC IDENTIFICATION

VAR17	Count / Row Pct / Col Pct / Tot Pct	VAR24 WHITE 1.00	BLACK 3.00	HISPANIC 4.00	ASIAN 5.00	OTHER 6.00	Row Total
YES	1.00	183	8	3	15	1	210
		87.1	3.8	1.4	7.1	.5	72.2
		72.3	61.5	60.0	83.3	50.0	
		62.9	2.7	1.0	5.2	.3	
NO	2.00	70	5	2	3	1	81
		86.4	6.2	2.5	3.7	1.2	27.8
		27.7	38.5	40.0	16.7	50.0	
		24.1	1.7	.7	1.0	.3	
	Column Total	253	13	5	18	2	291
		86.9	4.5	1.7	6.2	.7	100.0

Number of Missing Observations: 11

VAR12 HOW MUCH MORE FOR PESTICIDE-FREE
by VAR24 ETHNIC IDENTIFICATION

VAR12	Count / Row Pct / Col Pct / Tot Pct	VAR24 WHITE 1.00	BLACK 3.00	HISPANIC 4.00	ASIAN 5.00	OTHER 6.00	Row Total
1.00		146	9	4	10	1	170
1 TO 9%		85.9	5.3	2.4	5.9	.6	73.3
		73.7	90.0	100.0	55.6	50.0	
		62.9	3.9	1.7	4.3	.4	
2.00		46	1		6	1	54
10 TO 24%		85.2	1.9		11.1	1.9	23.3
		23.2	10.0		33.3	50.0	
		19.8	.4		2.6	.4	
3.00		6			2		8
25% OR MORE		75.0			25.0		3.4
		3.0			11.1		
		2.6			.9		
Column Total		198	10	4	18	2	232
		85.3	4.3	1.7	7.8	.9	100.0

Number of Missing Observations: 70

VAR18 HOW MUCH MORE FOR IPM GROWN
by VAR24 ETHNIC IDENTIFICATION

VAR18	Count / Row Pct / Col Pct / Tot Pct	VAR24 WHITE 1.00	BLACK 3.00	HISPANIC 4.00	ASIAN 5.00	OTHER 6.00	Row Total
1.00		151	8	3	13	1	176
1 TO 9%		85.8	4.5	1.7	7.4	.6	75.5
		75.5	88.9	75.0	68.4	100.0	
		64.8	3.4	1.3	5.6	.4	
2.00		44		1	6		51
10 TO 24%		86.3		2.0	11.8		21.9
		22.0		25.0	31.6		
		18.9		.4	2.6		
3.00		5	1				6
25% OR MORE		83.3	16.7				2.6
		2.5	11.1				
		2.1	.4				
Column Total		200	9	4	19	1	233
		85.8	3.9	1.7	8.2	.4	100.0

Number of Missing Observations: 69

VAR13 GO TO ANOTHER GROCERY STORE FOR ORGANIC
by VAR24 ETHNIC IDENTIFICATION

VAR13	VAR24 WHITE 1.00	BLACK 3.00	HISPANIC 4.00	ASIAN 5.00	OTHER 6.00	Row Total
1.00 VERY LIKELY	43	2	1	5		51
	84.3	3.9	2.0	9.8		17.3
	16.8	15.4	20.0	26.3		
	14.6	.7	.3	1.7		
2.00 SOMEWHAT LIKELY	111	6	3	13	1	134
	82.8	4.5	2.2	9.7	.7	45.4
	43.4	46.2	60.0	68.4	50.0	
	37.6	2.0	1.0	4.4	.3	
3.00 NOT LIKELY	102	5	1	1	1	110
	92.7	4.5	.9	.9	.9	37.3
	39.8	38.5	20.0	5.3	50.0	
	34.6	1.7	.3	.3	.3	
Column Total	256	13	5	19	2	295
	86.8	4.4	1.7	6.4	.7	100.0

Number of Missing Observations: 7

VAR19 GO TO ANOTHER GROCERY STORE FOR IPM
by VAR24 ETHNIC IDENTIFICATION

VAR19	VAR24 WHITE 1.00	BLACK 3.00	HISPANIC 4.00	ASIAN 5.00	OTHER 6.00	Row Total
1.00 VERY LIKELY	44	2	1	4		51
	86.3	3.9	2.0	7.8		17.5
	17.3	16.7	20.0	21.1		
	15.1	.7	.3	1.4		
2.00 SOMEWHAT LIKELY	120	4	3	14		141
	85.1	2.8	2.1	9.9		48.5
	47.2	33.3	60.0	73.7		
	41.2	1.4	1.0	4.8		
3.00 NOT LIKELY	90	6	1	1	1	99
	90.9	6.1	1.0	1.0	1.0	34.0
	35.4	50.0	20.0	5.3	100.0	
	30.9	2.1	.3	.3	.3	
Column Total	254	12	5	19	1	291
	87.3	4.1	1.7	6.5	.3	100.0

Number of Missing Observations: 11

VAR15 MORE LIKELY TO BUY IPM FRUITS/VEG
by VAR24 ETHNIC IDENTIFICATION

VAR15	Count / Row Pct / Col Pct / Tot Pct	VAR24 WHITE 1.00	BLACK 3.00	HISPANIC 4.00	ASIAN 5.00	OTHER 6.00	Row Total
YES	1.00	225	12	5	19	1	262
		85.9	4.6	1.9	7.3	.4	89.1
		88.2	92.3	100.0	100.0	50.0	
		76.5	4.1	1.7	6.5	.3	
NO	2.00	30	1			1	32
		93.8	3.1			3.1	10.9
		11.8	7.7			50.0	
		10.2	.3			.3	
	Column Total	255	13	5	19	2	294
		86.7	4.4	1.7	6.5	.7	100.0

Number of Missing Observations: 8

VAR02 AVOID BUYING FROM SOME COUNTRIES
by VAR26 HIGHEST LEVEL OF EDUCATION COMPLETED

VAR02	Count / Row Pct / Col Pct / Tot Pct	VAR26 HIGH SCHOOL GRAD 1.00	VOCATIONAL/TECH 2.00	COLLEGE GRADUATE 3.00	POST GRADUATE 4.00	Row Total
1.00 YES		32	15	45	30	122
		26.2	12.3	36.9	24.6	41.5
		44.4	41.7	36.3	48.4	
		10.9	5.1	15.3	10.2	
2.00 NO		40	21	79	32	172
		23.3	12.2	45.9	18.6	58.5
		55.6	58.3	63.7	51.6	
		13.6	7.1	26.9	10.9	
	Column Total	72	36	124	62	294
		24.5	12.2	42.2	21.1	100.0

Number of Missing Observations: 8

VAR03 MORE LIKELY TO BUY GROWN IN NEW YORK
by VAR26 HIGHEST LEVEL OF EDUCATION COMPLETED

VAR03	Count / Row Pct / Col Pct / Tot Pct	VAR26 HIGH SCHOOL GRAD 1.00	VOCATIONAL/TECH 2.00	COLLEGE GRADUATE 3.00	POST GRADUATE 4.00	Row Total
1.00 YES		50	30	94	34	208
		24.0	14.4	45.2	16.3	70.7
		68.5	83.3	76.4	54.8	
		17.0	10.2	32.0	11.6	
2.00 NO		23	6	29	28	86
		26.7	7.0	33.7	32.6	29.3
		31.5	16.7	23.6	45.2	
		7.8	2.0	9.9	9.5	
	Column Total	73	36	123	62	294
		24.8	12.2	41.8	21.1	100.0

Number of Missing Observations: 8

VAR04 AWARE OF ANY NAMES OF CHEM. PESTICIDES
by VAR26 HIGHEST LEVEL OF EDUCATION COMPLETED

VAR04	Count / Row Pct / Col Pct / Tot Pct	VAR26 HIGH SCHOOL GRAD 1.00	VOCATIONAL/TECH 2.00	COLLEGE GRADUATE 3.00	POST GRADUATE 4.00	Row Total
1.00 YES		41	23	76	46	186
		22.0	12.4	40.9	24.7	63.9
		56.9	67.6	61.8	74.2	
		14.1	7.9	26.1	15.8	
2.00 NO		31	11	47	16	105
		29.5	10.5	44.8	15.2	36.1
		43.1	32.4	38.2	25.8	
		10.7	3.8	16.2	5.5	
Column Total		72	34	123	62	291
		24.7	11.7	42.3	21.3	100.0

Number of Missing Observations: 11

VAR05 EVER USED CHEM. PESTICIDES IN HOME
by VAR26 HIGHEST LEVEL OF EDUCATION COMPLETED

VAR05	Count / Row Pct / Col Pct / Tot Pct	VAR26 HIGH SCHOOL GRAD 1.00	VOCATIONAL/TECH 2.00	COLLEGE GRADUATE 3.00	POST GRADUATE 4.00	Row Total
1.00 YES		38	25	76	39	178
		21.3	14.0	42.7	21.9	61.0
		53.5	71.4	61.3	62.9	
		13.0	8.6	26.0	13.4	
2.00 NO		33	10	48	23	114
		28.9	8.8	42.1	20.2	39.0
		46.5	28.6	38.7	37.1	
		11.3	3.4	16.4	7.9	
Column Total		71	35	124	62	292
		24.3	12.0	42.5	21.2	100.0

Number of Missing Observations: 10

VAR06 USE BIO/NATURAL PESTICIDES IN HOME
by VAR26 HIGHEST LEVEL OF EDUCATION COMPLETED

VAR06	Count / Row Pct / Col Pct / Tot Pct	VAR26 HIGH SCHOOL GRAD 1.00	VOCATIONAL/TECH 2.00	COLLEGE GRADUATE 3.00	POST GRADUATE 4.00	Row Total
1.00 YES		29	19	45	31	124
		23.4	15.3	36.3	25.0	43.7
		42.6	55.9	37.5	50.0	
		10.2	6.7	15.8	10.9	
2.00 NO		39	15	75	31	160
		24.4	9.4	46.9	19.4	56.3
		57.4	44.1	62.5	50.0	
		13.7	5.3	26.4	10.9	
Column Total		68	34	120	62	284
		23.9	12.0	42.3	21.8	100.0

Number of Missing Observations: 18

VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD
by VAR26 HIGHEST LEVEL OF EDUCATION COMPLETED

VAR07	Count / Row Pct / Col Pct / Tot Pct	VAR26 HIGH SCHOOL GRAD 1.00	VOCATIONAL/TECH 2.00	COLLEGE GRADUATE 3.00	POST GRADUATE 4.00	Row Total
1.00 VERY CONCERNED		28	11	46	22	107
		26.2	10.3	43.0	20.6	36.4
		38.4	31.4	37.1	35.5	
		9.5	3.7	15.6	7.5	
2.00 SOMEWHAT CONCERN		42	22	73	34	171
		24.6	12.9	42.7	19.9	58.2
		57.5	62.9	58.9	54.8	
		14.3	7.5	24.8	11.6	
3.00 NOT CONCERNED		3	2	5	6	16
		18.8	12.5	31.3	37.5	5.4
		4.1	5.7	4.0	9.7	
		1.0	.7	1.7	2.0	
Column Total		73	35	124	62	294
		24.8	11.9	42.2	21.1	100.0

Number of Missing Observations: 8

VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD
by VAR26 HIGHEST LEVEL OF EDUCATION COMPLETED

VAR08	Count / Row Pct / Col Pct / Tot Pct	VAR26 HIGH SCHOOL GRAD 1.00	VOCATIONAL/TECH 2.00	COLLEGE GRADUATE 3.00	POST GRADUATE 4.00	Row Total
1.00 SERIOUS HAZARD		20	5	20	19	64
		31.3	7.8	31.3	29.7	21.8
		27.4	14.3	16.1	30.6	
		6.8	1.7	6.8	6.5	
2.00 MODERATE HAZARD		30	14	52	16	112
		26.8	12.5	46.4	14.3	38.1
		41.1	40.0	41.9	25.8	
		10.2	4.8	17.7	5.4	
3.00 SMALL HAZARD		13	7	27	13	60
		21.7	11.7	45.0	21.7	20.4
		17.8	20.0	21.8	21.0	
		4.4	2.4	9.2	4.4	
4.00 NOT A HEALTH HAZ		9	9	24	13	55
		16.4	16.4	43.6	23.6	18.7
		12.3	25.7	19.4	21.0	
		3.1	3.1	8.2	4.4	
5.00 NOT LIKELY PRESE		1		1	1	3
		33.3		33.3	33.3	1.0
		1.4		.8	1.6	
		.3		.3	.3	
Column Total		73	35	124	62	294
		24.8	11.9	42.2	21.1	100.0

Number of Missing Observations: 8

VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT
by VAR26 HIGHEST LEVEL OF EDUCATION COMPLETED

VAR09	Count / Row Pct / Col Pct / Tot Pct	VAR26 HIGH SCHOOL GRAD 1.00	VOCATIONAL/TECH 2.00	COLLEGE GRADUATE 3.00	POST GRADUATE 4.00	Row Total
1.00 SERIOUS CONTAM		21	6	40	23	90
		23.3	6.7	44.4	25.6	30.7
		29.2	17.1	32.3	37.1	
		7.2	2.0	13.7	7.8	
2.00 MODERATE CONTAM		29	18	41	19	107
		27.1	16.8	38.3	17.8	36.5
		40.3	51.4	33.1	30.6	
		9.9	6.1	14.0	6.5	
3.00 SMALL CONTAM		17	10	34	15	76
		22.4	13.2	44.7	19.7	25.9
		23.6	28.6	27.4	24.2	
		5.8	3.4	11.6	5.1	
4.00 SMALL/NOT A PROB		4	1	7	3	15
		26.7	6.7	46.7	20.0	5.1
		5.6	2.9	5.6	4.8	
		1.4	.3	2.4	1.0	
5.00 NOT LIKELY		1		2	2	5
		20.0		40.0	40.0	1.7
		1.4		1.6	3.2	
		.3		.7	.7	
Column Total		72	35	124	62	293
		24.6	11.9	42.3	21.2	100.0

Number of Missing Observations: 9

VAR27 TOTAL HOUSEHOLD INCOME IN 1994
by VAR02 AVOID BUYING FROM SOME COUNTRIES

VAR27	Count / Row Pct / Col Pct / Tot Pct	VAR02 YES 1.00	VAR02 NO 2.00	Row Total
1.00 LESS THAN $19,00		11 44.0 10.1 4.0	14 56.0 8.3 5.0	25 9.0
2.00 $20,000 TO 29,99		11 28.9 10.1 4.0	27 71.1 16.0 9.7	38 13.7
3.00 $30,000 TO 39,99		19 40.4 17.4 6.8	28 59.6 16.6 10.1	47 16.9
4.00 $40,000 TO 49,99		16 35.6 14.7 5.8	29 64.4 17.2 10.4	45 16.2
5.00 $50,000 TO 59,99		15 38.5 13.8 5.4	24 61.5 14.2 8.6	39 14.0
6.00 OVER $60,000		37 44.0 33.9 13.3	47 56.0 27.8 16.9	84 30.2
	Column Total	109 39.2	169 60.8	278 100.0

Number of Missing Observations: 24

VAR27 TOTAL HOUSEHOLD INCOME IN 1994
by VAR03 MORE LIKELY TO BUY GROWN IN NEW YORK

VAR27	Count / Row Pct / Col Pct / Tot Pct	VAR03 YES 1.00	VAR03 NO 2.00	Row Total
1.00 LESS THAN $19,00		17 68.0 8.8 6.1	8 32.0 9.5 2.9	25 9.0
2.00 $20,000 TO 29,99		26 70.3 13.4 9.4	11 29.7 13.1 4.0	37 13.3
3.00 $30,000 TO 39,99		32 66.7 16.5 11.5	16 33.3 19.0 5.8	48 17.3
4.00 $40,000 TO 49,99		30 66.7 15.5 10.8	15 33.3 17.9 5.4	45 16.2
5.00 $50,000 TO 59,99		32 82.1 16.5 11.5	7 17.9 8.3 2.5	39 14.0
6.00 OVER $60,000		57 67.9 29.4 20.5	27 32.1 32.1 9.7	84 30.2
Column Total		194 69.8	84 30.2	278 100.0

Number of Missing Observations: 24

VAR27 TOTAL HOUSEHOLD INCOME IN 1994
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

VAR27	Count / Row Pct / Col Pct / Tot Pct	VAR07 VERY CONCERNED 1.00	SOMEWHAT CONCERN 2.00	NOT CONCERNED 3.00	Row Total
1.00 LESS THAN $19,00		7	17	1	25
		28.0	68.0	4.0	9.0
		7.2	10.2	6.3	
		2.5	6.1	.4	
2.00 $20,000 TO 29,99		14	23	1	38
		36.8	60.5	2.6	13.6
		14.4	13.9	6.3	
		5.0	8.2	.4	
3.00 $30,000 TO 39,99		17	28	3	48
		35.4	58.3	6.3	17.2
		17.5	16.9	18.8	
		6.1	10.0	1.1	
4.00 $40,000 TO 49,99		15	29	1	45
		33.3	64.4	2.2	16.1
		15.5	17.5	6.3	
		5.4	10.4	.4	
5.00 $50,000 TO 59,99		12	26	1	39
		30.8	66.7	2.6	14.0
		12.4	15.7	6.3	
		4.3	9.3	.4	
6.00 OVER $60,000		32	43	9	84
		38.1	51.2	10.7	30.1
		33.0	25.9	56.3	
		11.5	15.4	3.2	
Column Total		97	166	16	279
		34.8	59.5	5.7	100.0

Number of Missing Observations: 23

VAR27 TOTAL HOUSEHOLD INCOME IN 1994
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR27	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HAZARD 3.00	NOT A HEALTH HAZ 4.00	NOT LIKELY PRESE 5.00	Row Total
LESS THAN $19,00	1.00	10	7	3	4	1	25
		40.0	28.0	12.0	16.0	4.0	9.0
		16.1	6.6	5.2	8.2	33.3	
		3.6	2.5	1.1	1.4	.4	
$20,000 TO 29,99	2.00	11	16	6	4		37
		29.7	43.2	16.2	10.8		13.3
		17.7	15.1	10.3	8.2		
		4.0	5.8	2.2	1.4		
$30,000 TO 39,99	3.00	8	19	9	12		48
		16.7	39.6	18.8	25.0		17.3
		12.9	17.9	15.5	24.5		
		2.9	6.8	3.2	4.3		
$40,000 TO 49,99	4.00	6	18	15	6		45
		13.3	40.0	33.3	13.3		16.2
		9.7	17.0	25.9	12.2		
		2.2	6.5	5.4	2.2		
$50,000 TO 59,99	5.00	13	10	9	7		39
		33.3	25.6	23.1	17.9		14.0
		21.0	9.4	15.5	14.3		
		4.7	3.6	3.2	2.5		
OVER $60,000	6.00	14	36	16	16	2	84
		16.7	42.9	19.0	19.0	2.4	30.2
		22.6	34.0	27.6	32.7	66.7	
		5.0	12.9	5.8	5.8	.7	
	Column Total	62	106	58	49	3	278
		22.3	38.1	20.9	17.6	1.1	100.0

Number of Missing Observations: 24

VAR27 TOTAL HOUSEHOLD INCOME IN 1994
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR27	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CONTAM 3.00	SMALL/NOT A PROB 4.00	NOT LIKELY 5.00	Row Total
LESS THAN $19,00	1.00	9	7	7	2		25
		36.0	28.0	28.0	8.0		9.1
		10.3	7.1	10.0	13.3		
		3.3	2.5	2.5	.7		
$20,000 TO 29,99	2.00	18	8	10	1		37
		48.6	21.6	27.0	2.7		13.4
		20.7	8.1	14.3	6.7		
		6.5	2.9	3.6	.4		
$30,000 TO 39,99	3.00	15	14	13	4	1	47
		31.9	29.8	27.7	8.5	2.1	17.0
		17.2	14.1	18.6	26.7	20.0	
		5.4	5.1	4.7	1.4	.4	
$40,000 TO 49,99	4.00	9	21	11	4		45
		20.0	46.7	24.4	8.9		16.3
		10.3	21.2	15.7	26.7		
		3.3	7.6	4.0	1.4		
$50,000 TO 59,99	5.00	13	17	8			38
		34.2	44.7	21.1			13.8
		14.9	17.2	11.4			
		4.7	6.2	2.9			
OVER $60,000	6.00	23	32	21	4	4	84
		27.4	38.1	25.0	4.8	4.8	30.4
		26.4	32.3	30.0	26.7	80.0	
		8.3	11.6	7.6	1.4	1.4	
	Column Total	87	99	70	15	5	276
		31.5	35.9	25.4	5.4	1.8	100.0

Number of Missing Observations: 26

VAR27 TOTAL HOUSEHOLD INCOME IN 1994
by VAR10 ACCEPT BLEMISHES FOR PESTICIDE-FREE

VAR27	Count / Row Pct / Col Pct / Tot Pct	VAR10 YES 1.00	VAR10 NO 2.00	Row Total
1.00 LESS THAN $19,00		15	10	25
		60.0	40.0	9.1
		8.6	9.9	
		5.4	3.6	
2.00 $20,000 TO 29,99		22	15	37
		59.5	40.5	13.4
		12.6	14.9	
		8.0	5.4	
3.00 $30,000 TO 39,99		27	20	47
		57.4	42.6	17.0
		15.4	19.8	
		9.8	7.2	
4.00 $40,000 TO 49,99		30	14	44
		68.2	31.8	15.9
		17.1	13.9	
		10.9	5.1	
5.00 $50,000 TO 59,99		26	13	39
		66.7	33.3	14.1
		14.9	12.9	
		9.4	4.7	
6.00 OVER $60,000		55	29	84
		65.5	34.5	30.4
		31.4	28.7	
		19.9	10.5	
Column Total		175	101	276
		63.4	36.6	100.0

Number of Missing Observations: 26

VAR27 TOTAL HOUSEHOLD INCOME IN 1994
by VAR16 ACCEPT BLEMISHES FOR IPM GROWN

VAR27	Count / Row Pct / Col Pct / Tot Pct	VAR16 YES 1.00	VAR16 NO 2.00	Row Total
LESS THAN $19,00	1.00	14	10	24
		58.3	41.7	8.8
		8.1	9.8	
		5.1	3.6	
$20,000 TO 29,99	2.00	21	16	37
		56.8	43.2	13.5
		12.2	15.7	
		7.7	5.8	
$30,000 TO 39,99	3.00	27	19	46
		58.7	41.3	16.8
		15.7	18.6	
		9.9	6.9	
$40,000 TO 49,99	4.00	30	15	45
		66.7	33.3	16.4
		17.4	14.7	
		10.9	5.5	
$50,000 TO 59,99	5.00	25	14	39
		64.1	35.9	14.2
		14.5	13.7	
		9.1	5.1	
OVER $60,000	6.00	55	28	83
		66.3	33.7	30.3
		32.0	27.5	
		20.1	10.2	
	Column Total	172	102	274
		62.8	37.2	100.0

Number of Missing Observations: 28

VAR27 TOTAL HOUSEHOLD INCOME IN 1994
by VAR11 WILLING TO PAY MORE FOR PESTICIDE-FREE

VAR27	Count / Row Pct / Col Pct / Tot Pct	VAR11 YES 1.00	VAR11 NO 2.00	Row Total
1.00 LESS THAN $19,00		18 72.0 8.9 6.5	7 28.0 9.2 2.5	25 9.0
2.00 $20,000 TO 29,99		29 76.3 14.3 10.4	9 23.7 11.8 3.2	38 13.6
3.00 $30,000 TO 39,99		28 58.3 13.8 10.0	20 41.7 26.3 7.2	48 17.2
4.00 $40,000 TO 49,99		32 71.1 15.8 11.5	13 28.9 17.1 4.7	45 16.1
5.00 $50,000 TO 59,99		28 71.8 13.8 10.0	11 28.2 14.5 3.9	39 14.0
6.00 OVER $60,000		68 81.0 33.5 24.4	16 19.0 21.1 5.7	84 30.1
Column Total		203 72.8	76 27.2	279 100.0

Number of Missing Observations: 23

VAR27 TOTAL HOUSEHOLD INCOME IN 1994
by VAR17 WILLING TO PAY MORE FOR IPM GROWN

VAR27	Count / Row Pct / Col Pct / Tot Pct	VAR17 YES 1.00	VAR17 NO 2.00	Row Total
LESS THAN $19,00	1.00	13	11	24
		54.2	45.8	8.7
		6.4	15.1	
		4.7	4.0	
$20,000 TO 29,99	2.00	24	13	37
		64.9	35.1	13.5
		11.9	17.8	
		8.7	4.7	
$30,000 TO 39,99	3.00	33	15	48
		68.8	31.3	17.5
		16.3	20.5	
		12.0	5.5	
$40,000 TO 49,99	4.00	34	11	45
		75.6	24.4	16.4
		16.8	15.1	
		12.4	4.0	
$50,000 TO 59,99	5.00	28	11	39
		71.8	28.2	14.2
		13.9	15.1	
		10.2	4.0	
OVER $60,000	6.00	70	12	82
		85.4	14.6	29.8
		34.7	16.4	
		25.5	4.4	
	Column Total	202	73	275
		73.5	26.5	100.0

Number of Missing Observations: 27

VAR27 TOTAL HOUSEHOLD INCOME IN 1994
by VAR12 HOW MUCH MORE FOR PESTICIDE-FREE

VAR27	Count / Row Pct / Col Pct / Tot Pct	VAR12 1 TO 9% 1.00	10 TO 24 % 2.00	25% OR M ORE 3.00	Row Total
LESS THAN $19,00	1.00	12	6		18
		66.7	33.3		8.1
		7.5	10.9		
		5.4	2.7		
$20,000 TO 29,99	2.00	25	5	1	31
		80.6	16.1	3.2	14.0
		15.7	9.1	12.5	
		11.3	2.3	.5	
$30,000 TO 39,99	3.00	29	7	1	37
		78.4	18.9	2.7	16.7
		18.2	12.7	12.5	
		13.1	3.2	.5	
$40,000 TO 49,99	4.00	24	9	1	34
		70.6	26.5	2.9	15.3
		15.1	16.4	12.5	
		10.8	4.1	.5	
$50,000 TO 59,99	5.00	23	9		32
		71.9	28.1		14.4
		14.5	16.4		
		10.4	4.1		
OVER $60,000	6.00	46	19	5	70
		65.7	27.1	7.1	31.5
		28.9	34.5	62.5	
		20.7	8.6	2.3	
	Column Total	159	55	8	222
		71.6	24.8	3.6	100.0

Number of Missing Observations: 80

VAR27 TOTAL HOUSEHOLD INCOME IN 1994
by VAR18 HOW MUCH MORE FOR IPM GROWN

VAR27	Count / Row Pct / Col Pct / Tot Pct	VAR18 1 TO 9% 1.00	VAR18 10 TO 24 % 2.00	VAR18 25% OR M ORE 3.00	Row Total
1.00 LESS THAN $19,00		10 62.5 6.1 4.5	5 31.3 9.6 2.2	1 6.3 16.7 .4	16 7.2
2.00 $20,000 TO 29,99		23 79.3 13.9 10.3	6 20.7 11.5 2.7		29 13.0
3.00 $30,000 TO 39,99		29 76.3 17.6 13.0	8 21.1 15.4 3.6	1 2.6 16.7 .4	38 17.0
4.00 $40,000 TO 49,99		27 73.0 16.4 12.1	9 24.3 17.3 4.0	1 2.7 16.7 .4	37 16.6
5.00 $50,000 TO 59,99		25 80.6 15.2 11.2	6 19.4 11.5 2.7		31 13.9
6.00 OVER $60,000		51 70.8 30.9 22.9	18 25.0 34.6 8.1	3 4.2 50.0 1.3	72 32.3
Column Total		165 74.0	52 23.3	6 2.7	223 100.0

Number of Missing Observations: 79

VAR27 TOTAL HOUSEHOLD INCOME IN 1994
by VAR13 GO TO ANOTHER GROCERY STORE FOR ORGANIC

VAR27	Count / Row Pct / Col Pct / Tot Pct	VAR13: VERY LIKELY 1.00	SOMEWHAT LIKELY 2.00	NOT LIKELY 3.00	Row Total
LESS THAN $19,00	1.00	3	13	9	25
		12.0	52.0	36.0	9.0
		6.5	10.2	8.6	
		1.1	4.7	3.2	
$20,000 TO 29,99	2.00	7	16	15	38
		18.4	42.1	39.5	13.7
		15.2	12.6	14.3	
		2.5	5.8	5.4	
$30,000 TO 39,99	3.00	8	23	17	48
		16.7	47.9	35.4	17.3
		17.4	18.1	16.2	
		2.9	8.3	6.1	
$40,000 TO 49,99	4.00	5	24	16	45
		11.1	53.3	35.6	16.2
		10.9	18.9	15.2	
		1.8	8.6	5.8	
$50,000 TO 59,99	5.00	8	16	15	39
		20.5	41.0	38.5	14.0
		17.4	12.6	14.3	
		2.9	5.8	5.4	
OVER $60,000	6.00	15	35	33	83
		18.1	42.2	39.8	29.9
		32.6	27.6	31.4	
		5.4	12.6	11.9	
	Column Total	46	127	105	278
		16.5	45.7	37.8	100.0

Number of Missing Observations: 24

VAR27 TOTAL HOUSEHOLD INCOME IN 1994
by VAR19 GO TO ANOTHER GROCERY STORE FOR IPM

VAR27	Count / Row Pct / Col Pct / Tot Pct	VAR19 VERY LIKELY 1.00	SOMEWHAT LIKELY 2.00	NOT LIKELY 3.00	Row Total
LESS THAN $19,00	1.00	4	13	7	24
		16.7	54.2	29.2	8.8
		8.7	9.6	7.5	
		1.5	4.7	2.6	
$20,000 TO 29,99	2.00	9	15	12	36
		25.0	41.7	33.3	13.1
		19.6	11.1	12.9	
		3.3	5.5	4.4	
$30,000 TO 39,99	3.00	7	26	15	48
		14.6	54.2	31.3	17.5
		15.2	19.3	16.1	
		2.6	9.5	5.5	
$40,000 TO 49,99	4.00	5	23	16	44
		11.4	52.3	36.4	16.1
		10.9	17.0	17.2	
		1.8	8.4	5.8	
$50,000 TO 59,99	5.00	7	20	12	39
		17.9	51.3	30.8	14.2
		15.2	14.8	12.9	
		2.6	7.3	4.4	
OVER $60,000	6.00	14	38	31	83
		16.9	45.8	37.3	30.3
		30.4	28.1	33.3	
		5.1	13.9	11.3	
	Column Total	46	135	93	274
		16.8	49.3	33.9	100.0

Number of Missing Observations: 28

VAR27 TOTAL HOUSEHOLD INCOME IN 1994
by VAR15 MORE LIKELY TO BUY IPM FRUITS/VEG

VAR27	Count / Row Pct / Col Pct / Tot Pct	VAR15 YES 1.00	VAR15 NO 2.00	Row Total
1.00 LESS THAN $19,00		19 76.0 7.8 6.9	6 24.0 18.8 2.2	25 9.1
2.00 $20,000 TO 29,99		32 86.5 13.2 11.6	5 13.5 15.6 1.8	37 13.5
3.00 $30,000 TO 39,99		43 91.5 17.7 15.6	4 8.5 12.5 1.5	47 17.1
4.00 $40,000 TO 49,99		39 86.7 16.0 14.2	6 13.3 18.8 2.2	45 16.4
5.00 $50,000 TO 59,99		36 94.7 14.8 13.1	2 5.3 6.3 .7	38 13.8
6.00 OVER $60,000		74 89.2 30.5 26.9	9 10.8 28.1 3.3	83 30.2
	Column Total	243 88.4	32 11.6	275 100.0

Number of Missing Observations: 27

VAR27 TOTAL HOUSEHOLD INCOME IN 1994
by VAR22 PRODUCE PURCHASE CATEGORY

VAR27	Count / Row Pct / Col Pct / Tot Pct	VAR22 HEAVY 1.00	MEDIUM 2.00	LIGHT 3.00	Row Total
1.00 LESS THAN $19,00		4 16.0 4.1 1.4	10 40.0 10.9 3.6	11 44.0 12.2 3.9	25 9.0
2.00 $20,000 TO 29,99		9 23.7 9.3 3.2	9 23.7 9.8 3.2	20 52.6 22.2 7.2	38 13.6
3.00 $30,000 TO 39,99		17 35.4 17.5 6.1	10 20.8 10.9 3.6	21 43.8 23.3 7.5	48 17.2
4.00 $40,000 TO 49,99		19 42.2 19.6 6.8	15 33.3 16.3 5.4	11 24.4 12.2 3.9	45 16.1
5.00 $50,000 TO 59,99		14 35.9 14.4 5.0	13 33.3 14.1 4.7	12 30.8 13.3 4.3	39 14.0
6.00 OVER $60,000		34 40.5 35.1 12.2	35 41.7 38.0 12.5	15 17.9 16.7 5.4	84 30.1
Column Total		97 34.8	92 33.0	90 32.3	279 100.0

Number of Missing Observations: 23

VAR29 AGE OF RESPONDENT
by VAR07 CONCERN ABOUT CHEM. PESTICIDES IN FOOD

VAR29	Count / Row Pct / Col Pct / Tot Pct	VAR07 VERY CONCERNED 1.00	SOMEWHAT CONCERNED 2.00	NOT CONCERNED 3.00	Row Total
1.00 19 YEARS OR UNDE		1 20.0 .9 .3	4 80.0 2.3 1.3		5 1.7
2.00 20 TO 29 YEARS		15 30.6 13.9 5.0	30 61.2 17.2 10.1	4 8.2 25.0 1.3	49 16.4
3.00 30 TO 39 YEARS		34 38.6 31.5 11.4	52 59.1 29.9 17.4	2 2.3 12.5 .7	88 29.5
4.00 40 TO 49 YEARS		24 36.4 22.2 8.1	39 59.1 22.4 13.1	3 4.5 18.8 1.0	66 22.1
5.00 50 TO 59 YEARS		16 38.1 14.8 5.4	24 57.1 13.8 8.1	2 4.8 12.5 .7	42 14.1
6.00 60 TO 70 YEARS		12 37.5 11.1 4.0	17 53.1 9.8 5.7	3 9.4 18.8 1.0	32 10.7
7.00 OVER 70 YEARS		6 37.5 5.6 2.0	8 50.0 4.6 2.7	2 12.5 12.5 .7	16 5.4
Column Total		108 36.2	174 58.4	16 5.4	298 100.0

Number of Missing Observations: 4

VAR29 AGE OF RESPONDENT
by VAR08 PEST. RESIDUES IN FOOD AS HEALTH HAZARD

VAR29	Count / Row Pct / Col Pct / Tot Pct	VAR08 SERIOUS HAZARD 1.00	MODERATE HAZARD 2.00	SMALL HA ZARD 3.00	NOT A HE ALTH HAZ 4.00	NOT LIKE LY PRESE 5.00	Row Total
19 YEARS OR UNDE	1.00		1 20.0 .9 .3	2 40.0 3.3 .7	2 40.0 3.6 .7		5 1.7
20 TO 29 YEARS	2.00	10 20.8 15.2 3.4	25 52.1 22.3 8.4	3 6.3 4.9 1.0	10 20.8 17.9 3.4		48 16.1
30 TO 39 YEARS	3.00	24 27.3 36.4 8.1	30 34.1 26.8 10.1	19 21.6 31.1 6.4	14 15.9 25.0 4.7	1 1.1 33.3 .3	88 29.5
40 TO 49 YEARS	4.00	12 17.9 18.2 4.0	26 38.8 23.2 8.7	17 25.4 27.9 5.7	11 16.4 19.6 3.7	1 1.5 33.3 .3	67 22.5
50 TO 59 YEARS	5.00	10 23.8 15.2 3.4	12 28.6 10.7 4.0	13 31.0 21.3 4.4	6 14.3 10.7 2.0	1 2.4 33.3 .3	42 14.1
60 TO 70 YEARS	6.00	8 25.0 12.1 2.7	9 28.1 8.0 3.0	7 21.9 11.5 2.3	8 25.0 14.3 2.7		32 10.7
OVER 70 YEARS	7.00	2 12.5 3.0 .7	9 56.3 8.0 3.0		5 31.3 8.9 1.7		16 5.4
	Column Total	66 22.1	112 37.6	61 20.5	56 18.8	3 1.0	298 100.0

Number of Missing Observations: 4

VAR29 AGE OF RESPONDENT
by VAR09 PESTICIDES AS ENVIRONMENTAL CONTAMINANT

VAR29	Count / Row Pct / Col Pct / Tot Pct	VAR09 SERIOUS CONTAM 1.00	MODERATE CONTAM 2.00	SMALL CO NTAM 3.00	SMALL/NO T A PROB 4.00	NOT LIKE LY 5.00	Row Total
19 YEARS OR UNDE	1.00	1	3				4
		25.0	75.0				1.4
		1.1	2.7				
		.3	1.0				
20 TO 29 YEARS	2.00	19	16	10	2	1	48
		39.6	33.3	20.8	4.2	2.1	16.2
		20.9	14.5	13.3	13.3	20.0	
		6.4	5.4	3.4	.7	.3	
30 TO 39 YEARS	3.00	32	30	21	5		88
		36.4	34.1	23.9	5.7		29.7
		35.2	27.3	28.0	33.3		
		10.8	10.1	7.1	1.7		
40 TO 49 YEARS	4.00	18	30	13	4	1	66
		27.3	45.5	19.7	6.1	1.5	22.3
		19.8	27.3	17.3	26.7	20.0	
		6.1	10.1	4.4	1.4	.3	
50 TO 59 YEARS	5.00	13	11	17		1	42
		31.0	26.2	40.5		2.4	14.2
		14.3	10.0	22.7		20.0	
		4.4	3.7	5.7		.3	
60 TO 70 YEARS	6.00	5	15	8	3	1	32
		15.6	46.9	25.0	9.4	3.1	10.8
		5.5	13.6	10.7	20.0	20.0	
		1.7	5.1	2.7	1.0	.3	
OVER 70 YEARS	7.00	3	5	6	1	1	16
		18.8	31.3	37.5	6.3	6.3	5.4
		3.3	4.5	8.0	6.7	20.0	
		1.0	1.7	2.0	.3	.3	
	Column Total	91	110	75	15	5	296
		30.7	37.2	25.3	5.1	1.7	100.0

Number of Missing Observations: 6

VAR29 AGE OF RESPONDENT
by VAR10 ACCEPT BLEMISHES FOR PESTICIDE-FREE

VAR29	Count / Row Pct / Col Pct / Tot Pct	VAR10 YES 1.00	VAR10 NO 2.00	Row Total
19 YEARS OR UNDE	1.00	2	2	4
		50.0	50.0	1.4
		1.1	1.8	
		.7	.7	
20 TO 29 YEARS	2.00	31	18	49
		63.3	36.7	16.6
		17.0	15.8	
		10.5	6.1	
30 TO 39 YEARS	3.00	62	26	88
		70.5	29.5	29.7
		34.1	22.8	
		20.9	8.8	
40 TO 49 YEARS	4.00	44	23	67
		65.7	34.3	22.6
		24.2	20.2	
		14.9	7.8	
50 TO 59 YEARS	5.00	27	14	41
		65.9	34.1	13.9
		14.8	12.3	
		9.1	4.7	
60 TO 70 YEARS	6.00	9	23	32
		28.1	71.9	10.8
		4.9	20.2	
		3.0	7.8	
OVER 70 YEARS	7.00	7	8	15
		46.7	53.3	5.1
		3.8	7.0	
		2.4	2.7	
	Column Total	182	114	296
		61.5	38.5	100.0

Number of Missing Observations: 6

VAR29 AGE OF RESPONDENT
by VAR16 ACCEPT BLEMISHES FOR IPM GROWN

VAR29	Count / Row Pct / Col Pct / Tot Pct	VAR16 YES 1.00	VAR16 NO 2.00	Row Total
19 YEARS OR UNDE	1.00	2	2	4
		50.0	50.0	1.4
		1.1	1.7	
		.7	.7	
20 TO 29 YEARS	2.00	28	20	48
		58.3	41.7	16.3
		15.6	17.4	
		9.5	6.8	
30 TO 39 YEARS	3.00	62	26	88
		70.5	29.5	29.9
		34.6	22.6	
		21.1	8.8	
40 TO 49 YEARS	4.00	45	21	66
		68.2	31.8	22.4
		25.1	18.3	
		15.3	7.1	
50 TO 59 YEARS	5.00	28	13	41
		68.3	31.7	13.9
		15.6	11.3	
		9.5	4.4	
60 TO 70 YEARS	6.00	8	23	31
		25.8	74.2	10.5
		4.5	20.0	
		2.7	7.8	
OVER 70 YEARS	7.00	6	10	16
		37.5	62.5	5.4
		3.4	8.7	
		2.0	3.4	
	Column Total	179	115	294
		60.9	39.1	100.0

Number of Missing Observations: 8

VAR29 AGE OF RESPONDENT
by VAR11 WILLING TO PAY MORE FOR PESTICIDE-FREE

VAR29	Count / Row Pct / Col Pct / Tot Pct	VAR11 YES 1.00	VAR11 NO 2.00	Row Total
19 YEARS OR UNDE	1.00	3	2	5
		60.0	40.0	1.7
		1.4	2.4	
		1.0	.7	
20 TO 29 YEARS	2.00	39	10	49
		79.6	20.4	16.4
		18.3	11.8	
		13.1	3.4	
30 TO 39 YEARS	3.00	68	20	88
		77.3	22.7	29.5
		31.9	23.5	
		22.8	6.7	
40 TO 49 YEARS	4.00	50	17	67
		74.6	25.4	22.5
		23.5	20.0	
		16.8	5.7	
50 TO 59 YEARS	5.00	26	15	41
		63.4	36.6	13.8
		12.2	17.6	
		8.7	5.0	
60 TO 70 YEARS	6.00	16	16	32
		50.0	50.0	10.7
		7.5	18.8	
		5.4	5.4	
OVER 70 YEARS	7.00	11	5	16
		68.8	31.3	5.4
		5.2	5.9	
		3.7	1.7	
	Column Total	213	85	298
		71.5	28.5	100.0

Number of Missing Observations: 4

VAR29 AGE OF RESPONDENT
by VAR17 WILLING TO PAY MORE FOR IPM GROWN

VAR29	Count / Row Pct / Col Pct / Tot Pct	VAR17 YES 1.00	VAR17 NO 2.00	Row Total
19 YEARS OR UNDE	1.00	3	2	5
		60.0	40.0	1.7
		1.4	2.4	
		1.0	.7	
20 TO 29 YEARS	2.00	35	13	48
		72.9	27.1	16.4
		16.7	15.9	
		12.0	4.5	
30 TO 39 YEARS	3.00	67	19	86
		77.9	22.1	29.5
		31.9	23.2	
		22.9	6.5	
40 TO 49 YEARS	4.00	54	13	67
		80.6	19.4	22.9
		25.7	15.9	
		18.5	4.5	
50 TO 59 YEARS	5.00	27	12	39
		69.2	30.8	13.4
		12.9	14.6	
		9.2	4.1	
60 TO 70 YEARS	6.00	16	15	31
		51.6	48.4	10.6
		7.6	18.3	
		5.5	5.1	
OVER 70 YEARS	7.00	8	8	16
		50.0	50.0	5.5
		3.8	9.8	
		2.7	2.7	
	Column Total	210	82	292
		71.9	28.1	100.0

Number of Missing Observations: 10

VAR29 AGE OF RESPONDENT
by VAR12 HOW MUCH MORE FOR PESTICIDE-FREE

VAR29	Count / Row Pct / Col Pct / Tot Pct	VAR12 1 TO 9% 1.00	VAR12 10 TO 24 % 2.00	VAR12 25% OR M ORE 3.00	Row Total
19 YEARS OR UNDE	1.00	4			4
		100.0			1.7
		2.3			
		1.7			
20 TO 29 YEARS	2.00	27	14		41
		65.9	34.1		17.5
		15.8	25.5		
		11.5	6.0		
30 TO 39 YEARS	3.00	53	15	6	74
		71.6	20.3	8.1	31.6
		31.0	27.3	75.0	
		22.6	6.4	2.6	
40 TO 49 YEARS	4.00	38	17		55
		69.1	30.9		23.5
		22.2	30.9		
		16.2	7.3		
50 TO 59 YEARS	5.00	22	5	1	28
		78.6	17.9	3.6	12.0
		12.9	9.1	12.5	
		9.4	2.1	.4	
60 TO 70 YEARS	6.00	17	3	1	21
		81.0	14.3	4.8	9.0
		9.9	5.5	12.5	
		7.3	1.3	.4	
OVER 70 YEARS	7.00	10	1		11
		90.9	9.1		4.7
		5.8	1.8		
		4.3	.4		
	Column Total	171	55	8	234
		73.1	23.5	3.4	100.0

Number of Missing Observations: 68

VAR29 AGE OF RESPONDENT
by VAR18 HOW MUCH MORE FOR IPM GROWN

VAR29	Count / Row Pct / Col Pct / Tot Pct	VAR18 1 TO 9% 1.00	10 TO 24 % 2.00	25% OR M ORE 3.00	Row Total
19 YEARS OR UNDE	1.00	4			4
		100.0			1.7
		2.3			
		1.7			
20 TO 29 YEARS	2.00	26	13		39
		66.7	33.3		16.7
		14.8	25.0		
		11.1	5.6		
30 TO 39 YEARS	3.00	58	15	3	76
		76.3	19.7	3.9	32.5
		33.0	28.8	50.0	
		24.8	6.4	1.3	
40 TO 49 YEARS	4.00	41	14	1	56
		73.2	25.0	1.8	23.9
		23.3	26.9	16.7	
		17.5	6.0	.4	
50 TO 59 YEARS	5.00	23	5		28
		82.1	17.9		12.0
		13.1	9.6		
		9.8	2.1		
60 TO 70 YEARS	6.00	13	5	2	20
		65.0	25.0	10.0	8.5
		7.4	9.6	33.3	
		5.6	2.1	.9	
OVER 70 YEARS	7.00	11			11
		100.0			4.7
		6.3			
		4.7			
	Column Total	176	52	6	234
		75.2	22.2	2.6	100.0

Number of Missing Observations: 68

VAR29 AGE OF RESPONDENT
by VAR15 MORE LIKELY TO BUY IPM FRUITS/VEG

VAR29	Count / Row Pct / Col Pct / Tot Pct	VAR15 YES 1.00	VAR15 NO 2.00	Row Total
19 YEARS OR UNDE	1.00	4 100.0 1.5 1.4		4 1.4
20 TO 29 YEARS	2.00	41 85.4 15.6 13.9	7 14.6 21.2 2.4	48 16.3
30 TO 39 YEARS	3.00	79 90.8 30.2 26.8	8 9.2 24.2 2.7	87 29.5
40 TO 49 YEARS	4.00	61 91.0 23.3 20.7	6 9.0 18.2 2.0	67 22.7
50 TO 59 YEARS	5.00	37 90.2 14.1 12.5	4 9.8 12.1 1.4	41 13.9
60 TO 70 YEARS	6.00	25 78.1 9.5 8.5	7 21.9 21.2 2.4	32 10.8
OVER 70 YEARS	7.00	15 93.8 5.7 5.1	1 6.3 3.0 .3	16 5.4
	Column Total	262 88.8	33 11.2	295 100.0

Number of Missing Observations: 7